Vol. 1032 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 12, 1983 Volume 1032 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

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GENERAL INFORMATION concerning TRADEMARKS.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 3, 1982.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,034,622, Re. S.N. 493,428, Filed May 10, 1983, Cl. 74/501, INFINITELY ADJUSTABLE CABLE-CONTROLLED APPARATUS AND METHOD, James R. Deck, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Paul S. Lempio, Ex. Gp.: 352

4,226,300, Re. S.N. 486,817, Filed Apr. 20, 1983, Cl. 182/2, SELF PROPELLED AND EXTENSIBLE BOOM LIFT, Rallie P. Rallis, et al., Owner of Record: *Mark Industries, Carson City, Calif.,* Attorney or Agent: Robert R. Thornton, Ex. Gp.: 354

4,257,702, Re. S.N. 475,540, Filed Mar. 15, 1983, Cl. 355/71, APPARATUS FOR ASCERTAINING COLOR BALANCE OF PHOTOGRAPHIC PRINTING PAPER, Bertram W. Miller, Owner of Record: *Inventor,* Attorney or Agent: David G. Parkhurst, Ex. Gp.: 211

4,267,930, Re. S.N. 484,547, Filed Apr. 13, 1983, Cl. 209/31, RAISIN SEPARATING DEVICE, Douglas H. Melkonian, Owner of Record: *Inventor,* Attorney or Agent: Louis J. Knobbe, Ex. Gp.: 312

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Des. 256,345, Reexam. No. 90/000,388, Requested: May 31, 1983, Cl. D12/202, TIRE CARRIER FOR A VAN TYPE VEHICLE, Raywood C. Weiler, Owner of Record: *BMC Products, Chicago, Ill.,* Attorney or Agent: Nathan N. Kraus, Ex. Gp.: 291, Requester: William J. Wade, Long Beach, Calif.

Re. 30,659, Reexam. No. 90/000,386, Requested: June 1, 1983, Cl. 401/209, PEN POINTS FOR WRITING INSTRUMENTS, Nobuyuki Otake, et al., Owner of Record: *Requester,* Attorney or Agent: Parkhurst & Oliff, Ex. Gp.: 336, Requester: Tokyo Boshi, Kabushiki Kaisha, Tokyo, Japan

3,788,284, Reexam. No. 90/000,390, Requested: June 2, 1983, Cl. 123/571, FEEDBACK MODULATION OF EXHAUST GASES IN INTERNAL COMBUSTION ENGINES, Conrad O. Gardner, Owner of Record: *Conrad O. Gardner, West Edmonds, Wash.,* Attorney or Agent: Morris A. Case, Ex. Gp.: 340, Requester: Owner

4,019,666, Reexam. No. 90/000,396, Requested: June 6, 1983, Cl. 227/119, FASTENER ATTACHING MACHINE HAVING MEANS FOR ORIENTING CAPS, BUTTONS AND THE LIKE, Jonathan Asa Foults, Owner of Record: *Scovill Mfg. Co., Waterbury, Conn.,* Attorney or Agent: Dallett Hoopes, Ex. Gp.: 320 Requester: Rau Fastener Div. of U.S. Industries, Inc., Providence, R.I.

4,020,830, Reexam. No. 90/000,395, Requested: June 6, 1983, Cl. 128/632, SELECTIVE CHEMICAL SENSITIVE FET TRANSDUCERS, Curtis C. Johnson, et al., Owner of Record: *University of Utah, Salt Lake City, Utah,* Attorney or Agent: Criddle, Thorpe, & Western, Ex. Gp.: 330, Requester: Leon Horne, Arlington, Va.

Department of Commerce
Patent and Trademark Office
37 CFR Part 2
[Docket No. 30428–69]

Trademark Applications and Examination Proceedings; Trademark Interference, Concurrent Use, Opposition and Cancellation Proceedings; Trademark Post-Registration Proceedings; Correction

Agency: Patent and Trademark Office, Commerce.

Action: Final rule, correction.

Summary: This document corrects a final rule notice appearing in the **Federal Register** on May 23, 1983 (48 FR 23122) that amended the Patent and Trademark Office rules of practice in trademark cases to revise or codify existing practices, simplify procedures, or establish time periods for the purpose of facilitating the orderly and prompt resolution of issues before the Office in several types of proceedings.

For Further Information Contact: Miss Janet E. Rice by telephone at (703) 557–3551 or by mail addressed to the

Commissioner of Patents and Trademarks, Attention: Miss Janet E. Rice, Crystal Square 5, Suite 1008, Washington, D.C. 20231.

The following corrections are made:

1. On page 23122, third column, line 8, "§1.101" should read "§2.101".
2. On page 23129, first column, line 11, "(f)" should read "(f)(5)".
3. On page 23129, second column, line 11, the word "is" should read "in".
4. On page 23131, first column, line 57, "§2.120(c)(2)" should read "§2.122(c)(2)".
5. On page 23131, third column, line 35, the word "deception" should read "exception".
6. On page 23134, second column, line 26, the word "filing" should read "filings".
7. On page 23135, column 1, in the tenth line after the heading "§2.96 Issue; burden of proof.", the word "party" should appear after the word "junior".
8. On page 23135, column 2, line 10, the word "this" should read "his".
9. On page 23135, column 2, line 22, the word "file" should read "filed".
10. On page 23135, column 2, line 50, the word "and" should read "an".
11. On page 23135, column 3, line 30, the comma after the word "examiner" should be a semicolon.
12. On page 23136, column 1, in the first line after the heading "§2.113 Notification of cancellation proceeding.", the designation "(a)" should be stricken.
13. On page 23138, column 2, line 58, the "w" in "when" should be capitalized.
14. On page 23139, column 2, line 22, the 3 asterisks should be stricken. An additional line should be added directly below line 22. The new line 23 should consist of 5 asterisks along the center of the line, with four spaces between each asterisk. The text should then be resumed on line 24 with what was previously line 23.
15. On page 23140, column 3, line 38, the word "due" should be inserted after the word "be".
16. On page 23142, column 3, line 6, the "p" in "part" should be capitalized.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

June 8, 1983.

[FR Doc. 83-15831 Filed 6-13-83; 8:45 am]
BILLING CODE 3510-16-M

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

GEORGE KUDRAVETZ,
Program Manager,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-202,396 (4,382,813). ENCAPSULATION BY ENTRAPMENT WITHIN STARCH ADDUCT MATRIX.

SN 6-245,461 (4,382,950). INSECT REPELLANTS.

SN 6-300,784 (4,383,390). METHOD AND APPARATUS FOR HOT-CALLUSING GRAFT UNIONS.

SN 6-385,204 (4,384,866). PROCESS FOR PRODUCING DURABLE PRESS FABRICS THROUGH PHOSPHORYLATION.

ENVIRONMENTAL PROTECTION AGENCY

SN 6-149,541 (4,384,843). COMBUSTION METHOD AND APPARATUS WITH CATALYTIC TUBES.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-468,776. DRILL GUIDE FOR BONE PLATE FIXATION

SN 6-491,789. ANTINEOPLASTIC 1-HYDROXY-4-(SUBSTITUTED AMINOALKYL-AMINO) ANTHRAQUINONES.

SN 6-495,725. MONOCLONAL ANTIBODIES AGAINST NON SMALL CELL LUNG CANCER.

NATIONAL SECURITY AGENCY

SN 6-180,075 (4,383,261). METHOD FOR LASER RECORDING UTILIZING DYNAMIC PREHEATING.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,734,758, Henryk A. Cyba and Allen K. Sparks, NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER, Interference No. 100,053, decided Feb. 23, 1983, claim 1.

Patent No. 3,854,888, Gunther Frietzsche and Peter Krause, DEVICE FOR THE PURIFICATION OF WASTE GASES OF INTERNAL COMBUSTION ENGINES, Interference No. 100,898, decided Apr. 1, 1983, claims 1 & 3.

Patent No. 3,865,446, Pasquale P. J. Mastronardi, STORAGE MEANS WITH SHIFTABLE UNITS, Interference No. 100,955, decided May 3, 1983, claims 1-6 & 8.

Patent No. 3,884,693, Sigrid Bauer and Helga Sikora, LIGHT-SENSITIVE TRANSFER MATERIAL, Interference No. 99,991, decided Feb. 10, 1982, claims 1, 3-9 & 12.

Patent No. 3,974,931, Thomas G. Moller, BOTTLE CAP, Interference No. 100,243, decided Apr. 23, 1982, claim 7.

Patent No. 4,050,508, Bruce S. Buckley, CONTROLLABLE HEAT TRANSMISSION PANELS, Interference No. 100,232, decided Jan. 21, 1983, claims 16 & 18.

Patent No. 4,060,110, Allen M. Bower, VAPOUR RECOVERY NOZZLE, Interference No. 100,179, decided Feb. 10, 1983, claims 1 & 2.

Patent No. 4,231,246, Edward J. Gorenc, Ulles E. Fox and Imre A. Lesko, CRIMPING TOOL FOR TUBULAR-LIKE OBJECTS AND METHOD, Interference No. 100,853, decided May 13, 1983, claims 1, 6, 11, 12, 13 & 16.

Patent No. 4,263,100, Dieter Stalherm and Janos Bocsanczy, METHOD AND APPARATUS FOR REDUCING FINE DUST EMISSION WHILE CHARGING PREDRIED AND PREHEATED COAL INTO COKE OVENS, Interference No. 100,938, decided Apr. 14, 1983, claims 1, 5 & 6.

Patent No. 4,278,599, Gary T. Clark, MONO AZO DYES FROM (2 -ALKOXY-5 -ALKANOYLAMINO-ANILINO) ALKOXY OR ARYLOXY ALKANES, Interference No. 100,922, decided Apr. 14, 1983, claims 1-3, 5 & 6.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of July 12, 1983

D. 268,277	4,340,486	4,359,578	4,374,839
3,850,752	4,342,075	4,360,615	4,374,869
4,132,463	4,343,982	4,360,708	4,376,398
4,142,399	4,344,800	4,360,788	4,376,638
4,153,825	4,346,227	4,361,387	4,377,482
4,211,571	4,346,343	4,361,620	4,378,096
4,243,431	4,348,584	4,361,773	4,378,376
4,249,342	4,350,871	4,364,494	4,378,773
4,264,198	4,350,877	4,364,875	4,380,312
4,271,839	4,351,981	4,365,929	4,380,610
4,276,379	4,352,026	4,366,411	4,380,638
4,279,034	4,352,068	4,366,741	4,380,734
4,283,990	4,352,135	4,368,510	4,381,165
4,300,661	4,352,920	4,370,653	4,381,374
4,302,648	4,354,518	4,371,200	4,381,491
4,308,868	4,354,886	4,371,403	4,381,680
4,312,876	4,355,098	4,372,708	4,381,715
4,333,099	4,357,219	4,372,738	4,382,299
4,335,355	4,357,665	4,372,835	4,382,671
4,338,534	4,358,774	4,373,073	4,383,109
4,338,768	4,359,055	4,374,050	4,383,267
4,339,078	4,359,178	4,374,257	4,383,423
4,339,743	4,359,512	4,374,733	

Disclaimers

4,108,029.—*Alexander Borzym,* Dearborn, Mich. CUT-OFF DIE SET. Patent dated Aug. 22, 1978. Disclaimer filed May 4, 1983, by the assignee, *Alpha Industries, Inc.*

Hereby enters this disclaimer to claim 12 of said patent.

4,345,234.—*Steven A. Reich,* Waterloo, Iowa. MULTIPLE ELEMENT THERMAL ACTUATOR. Patent dated Aug. 17, 1982. Disclaimer filed Dec. 27, 1982, by the assignee, *Deere & Co.*

Hereby enters this disclaimer to all claims of said patent.

Dedication

3,870,515.—*Norbett H. Kaupp,* Newark, N.Y. METHOD FOR ELECTROSTATIC PAPER STRIPPING BY NEUTRALIZATION OF TRANSFER CHARGE. Patent dated Mar. 11, 1975. Dedication filed Oct. 21, 1982, by the assignee, *Xerox Corp.*

Hereby dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sacramento: California State Library	(916) 322-4572
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

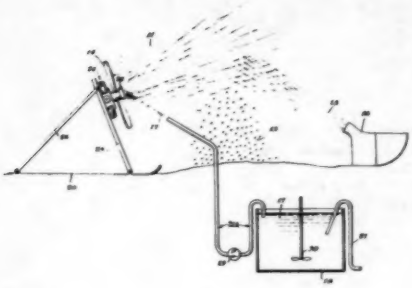
Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

JULY 12, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 2,968,164 (104th)
METHOD OF GENERATING SNOW
Alden W. Hanson, 3124 Valley Dr., Midland, Mich. 48640
Reexamination Request No. 90/000,158, Feb. 12, 1982.
Reexamination Certificate for Patent No. 2,968,164 issued Jan. 17, 1961, Ser. No. 716,906, Feb. 24, 1958.
U.S. Cl. 62/74 **Int. Cl.³ F25C *1/100*; A01G *15/100***



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 and 5–7 is confirmed.

Claim 4 was previously disclaimed.

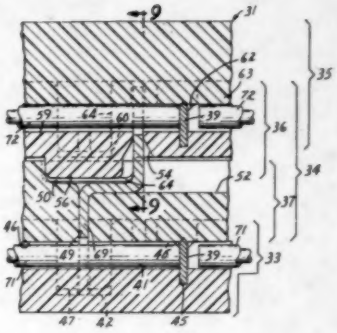
1. The method of forming, distributing, and depositing snow upon a surface, including: mechanically providing a large volume movement of air at atmospheric pressure, said movement of air created by a motor-driven propeller, said air having an ambient temperature at or below about 30 degrees Fahreanheit; and projecting water into said movement of air in an amount and at a rate such that substantially all of the water so-introduced is at least partially crystalized prior to depositing on said surface.

B1 3,708,779 (105th)
WIRE-SPLICING APPARATUS AND METHOD
Dennis J. Enright, St. Paul; Richard D. Kahabka, Burnsville; Donald F. Miller, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-Part of Ser. No. 823,598, May 12, 1969.
Reexamination Request No. 90/000,032, Jul. 23, 1981.
Reexamination Certificate for Patent No. 3,708,779, issued Jan. 2, 1973, Ser. No. 91,781, Nov. 23, 1970.
U.S. Cl. 339/99 R **Int. Cl.³ H01R *13/38, 11/20***

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–23 is confirmed.

1. A body member adapted for assembly with cooperating base and cover members in providing modular connection between corresponding wires of opposing cable-ends, said body member comprising an elongate insulating body having opposing faces, transversely grooved across one face to provide a series of parallel open-ended wire-receiving channels, transversely ridged across the opposing face to provide a corresponding series of parallel wire-supporting ridges, and containing contact elements extending through said body between said channels and the opposing ridges for making electrical connection between wires supported along substantially the entire length thereof which lie within said channels and wires supported along substantially the entire length thereof which lie on said ridges.



B1 3,866,100 (106th)
UNIVERSAL MOTOR CONTROL
Daniel P. Palenchar; Wayne H. Lehker; David P. Lock, all of Marietta, Ohio, assignors to Kardex Systems, Inc., New York
Reexamination Request No. 90/000,215, Jun. 7, 1982.
Reexamination Certificate for Patent No. 3,866,100, issued Feb. 11, 1975, Ser. No. 365,241, May 30, 1973.
U.S. Cl. 318/257 **Int. Cl.³ G05B *11/14***

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 2, 3, 5–7, and 9–12 is confirmed.

Claims 1, 4 and 8, having been finally determined to be unpatentable, are cancelled.

[1. A motor control circuit for controlling a motor having an armature and a series field winding, said motor control circuit comprising:

a source of full wave rectified AC voltage;

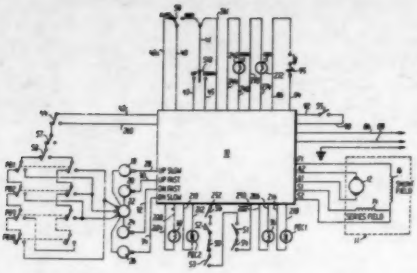
means connecting said armature and said series field winding in series across said source of voltage, said means including gating means for selectively connecting said source and said armature so that current may flow through said armature in a first or second direction;

comparator means responsive to a reference voltage and feedback signal for producing output pulses each having a duration proportional to the difference in magnitude of the signals being compared;

means responsive to said source for applying a reference voltage to said comparator means;

feedback means responsive to a signal from said motor representing motor speed for applying a feedback signal to said comparator means;

logic circuit means including means for selectively generating a first and second direction command; and,



phase controller means responsive to said source, said comparator, and said direction commands for selectively producing phase control pulses;

said gating means being responsive to said phase control pulses and said direction commands for selectively connecting said source and said armature.]

REISSUES

JULY 12, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,304

MACHINE FOR DRILLING HOLES IN RIGHT-ANGULAR WORK SURFACES

Yoshihiro Tsukiji, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

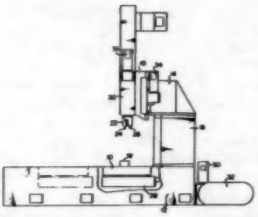
Original No. 4,097,175, dated Jun. 27, 1978, Ser. No. 757,057, Jan. 5, 1977. Application for reissue Jan. 3, 1980, Ser. No. 109,260

Claims priority, application Japan, Jun. 20, 1975, 50-074370

Int. Cl.³ B23B *7/00, 39/14, 41/00*

U.S. Cl. 29—27 C

3 Claims



4. In a machine tool, in combination, a turntable, a crossrail extending parallel to the surface of said turntable, a carriage mounted on said crossrail for movement therealong, means for moving said carriage along said crossrail, a ram mounted on said carriage for movement toward and away from said turntable, said ram being further movable with said carriage along said crossrail, means for moving said ram toward and away from said turntable, a toolhead substantially integrally provided with a sleeve rotatably supported at that end of said ram which is disposed opposite to said turntable, said toolhead being pivotable relative to said ram about the axis of said sleeve extending at right angles with said crossrail and parallel to the surface of said turntable, a first drive shaft within said ram, means for imparting the rotation of said first drive shaft to said sleeve and thus for pivoting said toolhead relative to said ram, a toolholder rotatably supported by said toolhead for rotation about an axis lying in a plane parallel to said crossrail and at right angles with the surface of said turntable, a spindle rotatably mounted within said sleeve, a second drive shaft within said ram, means for imparting the rotation of said second drive shaft to said spindle, means for imparting the rotation of said spindle to said toolholder, a rotary cutting tool supported by said toolholder for simultaneous rotation therewith, a turning tool removably mounted directly on said end of said ram, locking means adapted to be actuated by said second drive shaft for securely but releasably locking said turning tool in position on said ram, and means for rotating said turntable relative to said turning tool.

Re. 31,305

LIFE PRESERVER OF THE ENCAPSULATED TYPE

Harold J. Moran, Trenton, N.J., assignor to Switlik Parachute Company, Inc., Trenton, N.J.

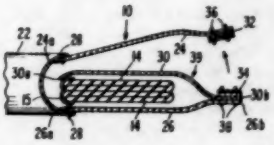
Original No. 4,297,758, dated Nov. 3, 1981, Ser. No. 115,982, Jan. 28, 1980. Application for reissue Apr. 1, 1982, Ser. No. 364,283

Int. Cl.³ B63C *9/16*

U.S. Cl. 441—123

12 Claims

1. In an inflatable life preserver of the encapsulated type including an inflatable cell means, said life preserver further including a cover adapted to provide a primary protective enclosure for the cell means in [an inflated] *a collapsed* condition of said means, said cover having flexible, normally connected panels in protective embracing relation to the [inflated] *collapsed* cell means and also having separable fastener elements on the panels adapted to disengage for separation of the panels in response to inflation of the cell means, the improvement that comprises a protective flap inside the cover adapted to cooperate with at least one of the panels to provide an auxiliary enclosure for the cell means in the event of accidental separation of the panels with the cell means in [an



inflated] *a collapsed* condition, the panels having inner edges connected together [to define said open center] and [have] *having* outer edges along which the [fastened] *fastener* elements are disposed, said flap having an outer edge secured to the outer edge of said one panel, the flap and said one panel being substantially coextensive in width with the flap having a free inner edge overlying and in close proximity to the inner edge of said one panel.

Re. 31,306

COLD ROLLED, DUCTILE, HIGH STRENGTH STEEL STRIP AND SHEET AND METHOD THEREFOR

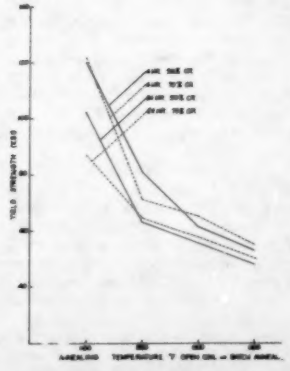
James A. Elias, deceased, late of Middletown, Ohio (by June G. Elias, executrix); John R. Newby, and Marvin B. Pierson, both of Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Original No. 4,067,754, dated Jan. 10, 1978, Ser. No. 674,862, Apr. 8, 1976. Division of Ser. No. 554,158, Feb. 28, 1975, Pat. No. 3,963,531. Application for reissue May 6, 1981, Ser. No. 260,904

Int. Cl.³ C21D *7/02, 7/14*

U.S. Cl. 148—12 F

7 Claims



1. A method of producing cold reduced low carbon steel strip and sheet stock having a 0.2% offset yield strength of at least 90 ksi and an elongation in two inches of greater than 10%

in the annealed condition, comprising the steps of providing a vacuum degassed, fully killed low carbon steel casting consisting essentially of, by weight percent, from 0.02% to about 0.10% carbon, about 0.1% to 0.9% manganese, 0.02% to about 0.18% columbium, residual phosphorus, sulfur, silicon, oxygen and nitrogen, about 0.01% to about 0.08% aluminum, and balance essentially iron except for incidental impurities, the columbium being substantially completely combined with carbon, hot rolling to intermediate gauge, coiling at a temperature [not higher than] *of about 1000° to* about 1300° F., removing hot mill scale, cold reducing to final gauge with a reduction in thickness of 40% to 70%, and annealing at a temperature and for a time sufficient to recover ductility but not recrystallize whereby to obtain an elongation of greater than 10% with a yield strength of at least 90 ksi.

Re. 31,307
METHOD FOR PREPARING CLAY-BASED GREASE COMPOSITIONS

Kenneth A. MacKenzie, Burlington, and Abraham Verboeff, Toronto, both of Canada, assignors to Shell Internationale Research Maatschap, IIJ B.V., The Hague, Netherlands

Original No. 4,122,022, dated Oct. 24, 1978, Ser. No. 815,691, Jul. 14, 1977. Application for reissue Sep. 29, 1980, Ser. No. 192,060

Claims priority, application Canada, Aug. 3, 1976, 258332; Aug. 3, 1976, 258332

Int. Cl.³ C10M *1/10, 3/02, 5/02, 7/04*

U.S. Cl. 252—28 **19 Claims**

1. In the method for preparing a clay-bearing grease which comprises mixing an aqueous clay hydrogel and a conjugate acid surfactant formed from an acid and an organic amine, which mixture is combined, with mixing, with a major proportion of a lubricating oil to result in a pre-grease phase containing the oil, clay and surfactant and a water phase; followed by separating the pre-grease phase from the water phase; the improvement which comprises:

(a) mixing with the pre-grease, from about 0.1 to about 20 weight percent of an epoxide, based upon the weight of the pre-grease before or after a dehydration step;

(b) heating the mixture [to a temperature not greater than 250° F.] to cure the epoxide; and

(c) milling the dried and cured mixture to form a clay-bearing grease.

Re. 31,308
Patent Not Issued For This Number

Re. 31,309
HIGH SOLIDS AMBIENT TEMPERATURE CURING COATINGS OF ACRYLIC-FATTY ACID DRYING OIL RESINS

Joseph A. Antonelli, Riverton, N.J.; Renee J. Kelly, Media, and Joseph E. McLaughlin, Philadelphia, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,242,243, dated Dec. 30, 1980, Ser. No. 58,662, Jul. 18, 1979. Application for reissue Jul. 7, 1981, Ser. No. 281,201

Int. Cl.³ C08L *25/14, 33/12*

U.S. Cl. 523—459 **20 Claims**

1. A high solids coating composition comprising a polymer having a backbone of polymerized monomers selected from the group consisting of an alkyl methacrylate, an alkyl acrylate, styrene or mixtures thereof and polymerized hydroxyl containing monomers selected from the group consisting of a hydroxyl alkyl acrylate, a hydroxy alkyl methacrylate [of] *or* mixtures thereof, wherein the active hydrogen of at least one pendant hydroxyl group of the backbone is replaced by

where R is the residual of a drying oil fatty acid and wherein the polymer has a glass transition temperature of at least 20° C. *and up to about 65° C. and the polymer has a number average molecular weight of about 1,500–8,000 and a weight average molecular weight of about 6,000–30,000 and a molecular weight distribution of about 1–5; wherein the composition contains about 0.01–5% by weight, based on the weight of the coating composition, of an organo metallic drier selected from the group consisting of cobalt, copper, lead, zirconium, calcium, iron, nickel, tin, zinc and lithium organo metallic driers and about 0.1–5% based on the weight of the polymer, of aluminum metal from an organo aluminum complex.*

Re. 31,310
IMPACT RESISTANT VINYL ESTER RESIN AND PROCESS FOR MAKING SAME

Daniel J. Najvar, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Original No. 3,892,819, dated Jul. 1, 1975, Ser. No. 343,716, Mar. 21, 1973. Continuation of Ser. No. 753,395, Dec. 22, 1976, abandoned. Application for reissue Feb. 25, 1980, Ser. No. 124,055

Int. Cl.³ C08F *283/10;* **C08G** *59/16*

U.S. Cl. 525—531 **16 Claims**

1. A process for preparing a thermosettable resin having improved impact resistance in the thermoset state which comprises [simultaneously] reacting the epoxide moieties of a polyepoxide having an average of more than one epoxide group per molecule with the acid moieties of an unsaturated monocarboxylic acid and a liquid carboxy terminated polydiene rubber wherein the combined acid equivalents of said unsaturated acid and said polydiene ranges from about 0.8 to 1.2 equivalents per epoxide equivalent and wherein at least about 80 percent of said acid equivalents comprises said unsaturated acid and the balance between 0.01 and 20 percent comprises said polydiene, provided that the polydiene rubber content is at least about 4 weight percent *and wherein said resin is prepared by the simultaneous reaction of said polyepoxide, said polydiene rubber and said monocarboxylic acid or by the sequential reaction wherein said polyepoxide and said polydiene rubber are reacted followed by addition and reaction of said monocarboxylic acid with the product of that first reaction.*

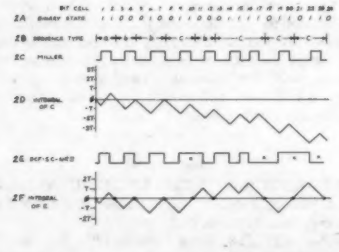
Re. 31,311
DC FREE ENCODING FOR DATA TRANSMISSION SYSTEM

Jerry W. Miller, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Original No. 4,027,335, dated May 31, 1977, Ser. No. 3,191,976. Application for reissue Jul. 13, 1981, Ser. No. 282,846

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—40 **14 Claims**



1. In a self-clocking transmission system for transmitting binary data sequentially in successive clocked bit cells of a transmission channel wherein logical first bit states are normally transmitted as signal transitions relatively early in [the] respective bit cells and logical second bit states are normally transmitted as signal transitions relatively late in respective bit cells and any [transitions] *transition* relatively early in a bit cell following a transition relatively late in the next preceding

bit cell is suppressed, apparatus for modifying the transmitted signal to remove any net DC component, said apparatus comprising first indicating means responsive to bit states for producing at the onset of a sequence of second bit states following a first bit state a first indicating signal indicating any such sequence that might introduce a DC component into the transmitted signal with normal transmission, and means responsive to said first indicating signal, a current bit and but one next succeeding bit for modifying the transmission of signal transitions to eliminate any DC [components] *component*.

PLANT PATENTS

GRANTED JULY 12, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,067

ROSE PLANT — MEIMAGARMIC VARIETY

Marie L. Meilland, Antibes, France, assignor to Conard-Pyle Company, West Grove, Pa.

Filed Nov. 23, 1981, Ser. No. 324,255
Claims priority, application France, Dec. 29, 1980, 2980
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of Hybrid Tea rose plant, substantially as illustrated and described, by the fact that:

from the physical standpoint the plant with light green adult wood has a semi-erect growth habit, forms dark green shiny leaves, and forms double flowers which are empire yellow and are edged with an amaranth red flush; and

from the biological standpoint the plant has vigorous and regular vegetation, an abundant and repeated florescence, the ability for its flowers to last a long time and for the petals to detach cleanly.

5,068

AFRICAN VIOLET NAMED SWAN LAKE

Arnold W. Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Apr. 9, 1981, Ser. No. 252,316
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—69 1 Claim

1. A new variety of African Violet plant, substantially as herein shown and described, characterized by its profuse production of large, deep pink flowers borne on upright stems to cluster above the plant foliage.

PATENTS

GRANTED JUL. 12, 1983

ERRATA

For CLASS	See PATENT NO.
089–033	4,392,407
604–202	4,392,491
604–082	4,392,492
123–342	4,392,502
180–217	4,392,536
128–079	4,392,526
427–194	4,392,908
376–133	4,392,918
428–355	4,393,080
424–074	4,393,086
323–355	4,393,157
377–056	4,393,301
382–022	4,393,366
361–074	4,393,487

PATENTS

GRANTED JULY 12, 1983

GENERAL AND MECHANICAL

4,392,257

METHOD OF MAKING DRESSES FOR DOLLS AND THE LIKE AND PRODUCT OBTAINED BY THIS METHOD

Giulio S. Furga, Via Fatebenefratelli 12, Milan, Italy

Filed Oct. 4, 1979, Ser. No. 82,213
Int. Cl.³ A41D *1/22*; B32B *33/00*
U.S. Cl. 2—105 7 Claims

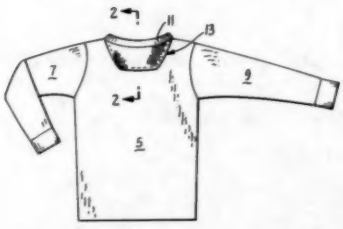
7. A dress for a doll or the like, said dress being defined by boundaries, said dress comprising two superposed portions of synthetic fabric, electronic weld lines joining said portions together located in closely spaced relation to said boundaries of said dress to simulate sewn seams, and said two portions of fabric having figures, designs, trimmings or the like, which define clothing portions such as collars, belts, pockets and the like, directly woven in said portions of said fabric, for instance, by a Jacquard system.

4,392,258

SHADE SHIRT

Michael H. O'Neill, 1071 41st Ave., Santa Cruz, Calif. 95062

Filed Dec. 16, 1982, Ser. No. 435,908
Int. Cl.³ A42B *1/06*; A41B *1/00*
U.S. Cl. 2—209.1 1 Claim



1. A convertible article of clothing having a fabric covering the upper torso in the manner of a T-shirt or sweater and having a neck opening defining a rear margin and a semistiff bill attached to said rear margin of the neck opening whereby said article of clothing can be worn as a shirt with the bill depending from the back of the garment or placed over the head with the bill in front serving as an eyeshade.

4,392,259

TROUSER CONSTRUCTION

Guido Bredo, No. 3, Via di Sant'Eustacchio, 00186 Rome, Italy

Filed Aug. 7, 1980, Ser. No. 176,227
Claims priority, application Italy, Aug. 29, 1979, 50127 A/79; Mar. 12, 1980, 48145 A/80
Int. Cl.³ A41D *1/06*
U.S. Cl. 2—227 19 Claims

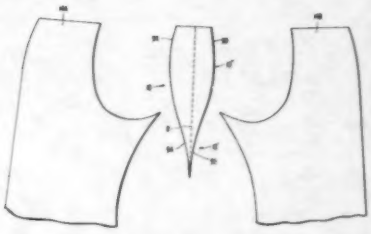
1. A trouser construction comprising right and left front parts and right and left rear parts for covering the respective front and rear of a wearer's right and left hip and thigh,

each said rear part having a top edge, a bottom edge, an outer edge extending substantially continuously between said top and bottom edges, a lower inner edge extending from said bottom edge to a region corresponding to the sacrum of the wearer and an upper inner edge extending from the region corresponding to the sacrum to the top edge,

each said front part having a central portion, a top edge, a bottom edge, an outer edge extending substantially continuously between said top and bottom edges, a lower inner edge extending from the bottom edge to the region of the sacrum of the wearer, said lower inner edge slanting away from said central portion in the region of the thigh of the wearer, a concave crotch edge extending from the region of the sacrum toward said central portion, and an upper inner edge extending from said crotch edge to said top edge,

an elongated crotch piece having a multiplicity of sides including elongated right and left continuous concave sides converging at one end thereof in an acute angle, the remainder of said sides forming a crotch piece top,

wherein said right and left front parts have their upper inner



edges shaped for complementary construction with said crotch piece top across the abdomen of the wearer,

said right front and rear parts are joined by a right outer seam along their outer edges and by a right inseam along their lower inner edges,

said left front and rear parts are joined by a left outer seam along their outer edges and by a left inseam along their lower inner edges,

said right and left rear parts are joined by a back seam along their upper inner edges,

said right front part is joined to said crotch piece by a right crotch joint along the crotch edge of said right front part and said right converging side of said crotch piece,

said left front part is joined to said crotch piece by a left crotch joint along the crotch edge of said left front part and said left converging side of said crotch piece,

whereby said back seam, said inseams and said crotch joints converge in the region of the sacrum, said acute angle of said converging sides of said crotch piece points rearwardly and said right and left crotch joints extend along anatomical lines from said sacrum to positions on the sides of the navel of the wearer,

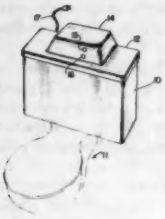
and said right and left front parts have their upper edges joined with said crotch piece top in complementary connection across the abdomen of the wearer.

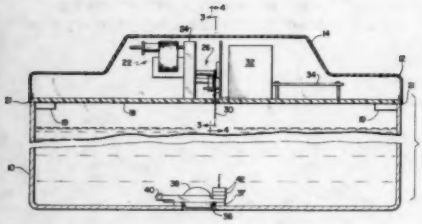
4,392,260

FLUSHING APPARATUS WITH SELECTIVE QUANTITY CONTROL

Court M. Bensen, 1250 Ralston St., Reno, Nev. 89503

Filed Jul. 6, 1982, Ser. No. 395,746
Int. Cl.³ E03D 1/14, 3/12
U.S. Cl. 4—324 3 Claims





1. An apparatus for selectively dispensing either of two predetermined quantities of flushing water from the storage tank of a toilet of the type having an opening in the bottom thereof through which flushing water passes, a valve member operable to open and close the opening, the valve member normally exhibiting a net positive buoyant force in water when removed from the opening, and upwardly extending means for operating the valve member by lifting it away from the opening, the apparatus comprising

weight means attached to said valve member for changing the buoyancy thereof from positive to negative;

motor means coupled to said means for operating, said motor means being operative, when energized, to exert an upward force on said means for operating to lift said valve member away from said opening, to hold said valve member in the lifted position against the downward force of said weight means, and to lower said valve member to its closed position without regard to the water level in the storage tank;

housing means for supporting said motor means above the water in said tank;

timing means for selectively producing energizing signals for said motor means in pairs to lift and lower said valve member, the leading edges of the signals in one said pair being separated by a first time interval and the leading edges of the signals in a second said pair being separated by a second, longer time interval; and

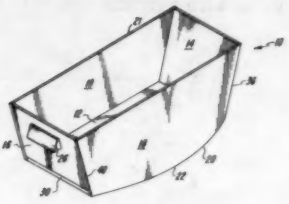
manually operable switch means for selecting one of said signal pairs, thereby selecting the interval said valve member is held in the open position.

4,392,261

BABY CRADLE

Loretta C. Ivory, 6263 S. Niagara Way, Englewood, Colo. 80111, and Frederick D. Hartmann, Aurora, Colo., assignors to Loretta C. Ivory, Englewood, Colo.

Filed Dec. 16, 1980, Ser. No. 216,805
Int. Cl.³ A47D 9/00
U.S. Cl. 5—101 9 Claims



1. In a cradle for a baby lying in a preselected orientation wherein the baby's head is nearer a head panel of said cradle, said cradle further having two longitudinally extending side panels and a foot panel, said foot panel and head panel are connected to the side panel, the side panels, foot panel and head panel are connected along a bottomost edge to a bottom panel and to each other, the cradle being adapted to rock on a floor surface, the improvement comprising:

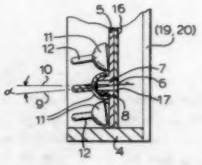
support means for said cradle integral to each of said side panels and having a longitudinally extending curvilinear surface for rocking said cradle in a longitudinal plane on said floor surface, said support means connected to said cradle, said curvilinear surface being asymmetric with respect to a transverse plane through a midpoint of the length of the cradle whereby said baby lies in said cradle in a head up position relative to the baby's feet when the cradle is in equilibrium regardless of the longitudinal position of the baby within said cradle.

4,392,262

APPARATUS FOR BREEDING QUEEN HONEYBEES

Johann R. Stickler, Klammweg 68, Willendorf, Austria A-2732

Filed Oct. 19, 1981, Ser. No. 312,715
Claims priority, application Austria, Oct. 17, 1980, 5169/80
Int. Cl.³ A01K 47/04, 49/00
U.S. Cl. 6—9 25 Claims



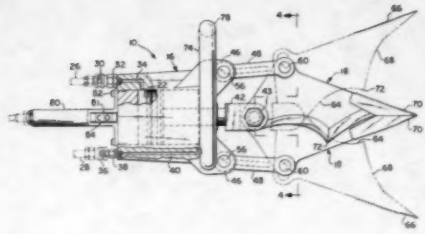
1. An apparatus for breeding queen honeybees in cells, which comprises a breeding frame, a honeycomb cell plate having a front face and a rear face, the honeycomb cell plate being affixed to the breeding frame, a multiplicity of tubular sockets projecting from the rear face of the honeycomb cell plate, the plate defining a like multiplicity of open cells extending from the front face through the cell plate, with each cell aligned with a socket such that an opening is formed extending completely through the cell plate and socket, and cup-shaped elements displaceably mounted on the sockets for closing the cells at the rear face.

4,392,263

PORTABLE RESCUE TOOL

Michael J. Amoroso, 210 N. Shoreland, Marion, Ill. 62959

Filed Feb. 2, 1981, Ser. No. 230,622
Int. Cl.³ B25F 1/00
U.S. Cl. 7—100 22 Claims



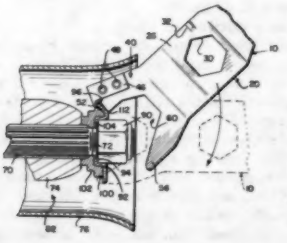
1. A tool for rescue work comprising:
(a) a body,
(b) a first jaw member having an outer prying and clamping portion and an inner cutting portion,
(c) a second jaw member having an outer prying and clamping portion and an inner cutting portion, said second member being offset from said first member and at least partially overlapping said first member to provide the cutting action, and
(d) means connecting said first and second jaw members to the body for opening and closing said jaw members, the cutting portion of the jaw members and the prying and clamping portion of the jaw members being operatively disposed on the same side of the connection means and said outer prying and clamping portions of the jaw members being interengageable in the closed position to facilitate the clamping and prying action and to facilitate use as a wedge.

4,392,264

COMBINATION TOOL FOR REMOVING AND REPLACING A NUT

James M. Booe, Jr., 7812 E. Vermont St., Indianapolis, Ind. 46219

Filed Feb. 26, 1981, Ser. No. 238,211
Int. Cl.³ B25B 27/00; B25F 1/04
U.S. Cl. 7—138 6 Claims



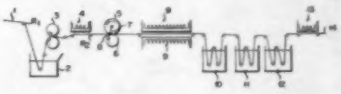
1. A combination tool for use in removing and replacing a nut which is locked on a threaded shaft by a locking member having bendable locking tabs projecting outwardly therefrom, the tool comprising an elongated lever having a proximal end section including a handle, a distal end section including a first finger for engaging and bending one tab upward upon movement of the lever, and a second finger for engaging and bending an opposing tab downward, the two fingers being separated by an outwardly opening space, and a wrench section interposed between the two end sections for engaging the nut, the first finger including means for engaging both upper and lower surfaces of the one tab, thereby to provide a fulcrum for the movement of the lever to bend the one tab upward and the opposing tab downward.

4,392,265

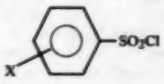
METHOD OF MODIFYING THE DYE AFFINITY OF CELLULOSE FIBER-CONTAINING STRUCTURE WITH BENZENE SULFONYL CHLORIDE

Takahiro Fujiu, Funabashi; Masao Nakajima, Tokyo, and Shigeru Okano, Musashino, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Nov. 12, 1981, Ser. No. 320,763
Claims priority, application Japan, Jun. 15, 1981, 56-92043; Jun. 19, 1981, 56-94925
The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.
Int. Cl.³ C09B 62/00; D06P 5/22
U.S. Cl. 8—120 9 Claims



1. A method of modifying the dye affinity of a cellulose fiber-containing structure, comprising the steps of treating a cellulose fiber structure or a mixed structure of a cellulose fiber and a synthetic fiber with an alkaline agent, coating the structure with an aqueous emulsion of an acid chloride having the formula:



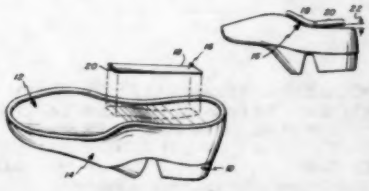
(wherein X is —H, —NO_2, —CH_3 or —SO_2Cl)
and subjecting the coated structure to heat treatment prior to drying of the emulsion to cause chemical modification.

4,392,266

MOLDED SHANKS

Steven M. LeBaron, Swampscott, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Jan. 15, 1982, Ser. No. 339,784
Int. Cl.³ A43D 31/00, 21/00
U.S. Cl. 12—146 S 11 Claims



9. A method for forming and applying a shank stiffener on the bottom of a shoe sole, said stiffener initially being in the form of an elongate flexible activatable material, the method comprising:
placing the stiffener material on the bottom of the insole;
supporting a portion of the stiffened material in spaced relation to the insole;

effecting curing of the stiffener material while said portion of the stiffener material is so supported whereby a part of the stiffener will cure in contact and conformity with the bottom of the insole and where a portion of the stiffener will cure in a spaced relation to the insole.

4,392,267

APPARATUS FOR CONTINUOUSLY PICKLING THE OUTER SURFACES OF TUBULAR MATERIALS

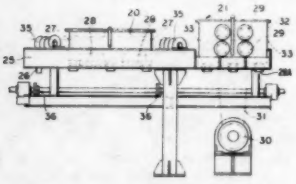
Yoshiro Tanaka; Hayato Moroi; Yukihiko Komatsu; Kazuo Akagi; Ryujiro Shitamatsu, all of Shimonoseki, and Tadashi Nishimura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 1, 1981, Ser. No. 307,676

Claims priority, application Japan, Aug. 12, 1981, 56-120156[U]

Int. Cl.³ B08B 9/02

U.S. Cl. 15—88 **6 Claims**



1. An apparatus for continuously pickling the outer surface of hermetically plugged tubular members comprising:

a plurality of liquid containing tanks which separately contain different pickling liquids and define through-holes in respective front and rear walls thereof on at least one common longitudinal line to permit the successive passage of the tubular members therethrough;

means for successively feeding the tubular members through said through-holes and for rotating the tubular materials around their respective longitudinal axes;

a cleaning tank containing a cleaning liquid; and

a cleaning brush unit positioned upstream of said plurality of tanks and downstream of said cleaning tank wherein said cleaning tank further comprises at least one ultrasonic cleaning oscillator disposed therein and defining sealed through-holes in the front and rear walls thereof for allowing said tubular members to pass through said cleaning tank and subsequently to said cleaning brush unit.

4,392,268

CHALKBOARD ERASER CLEANER SYSTEM

Victor M. Bueno, 708 Opelousas Ave., Algiers, La. 70114

Filed Dec. 14, 1981, Ser. No. 330,687

Int. Cl.³ A47L 25/00

U.S. Cl. 15—91 **9 Claims**

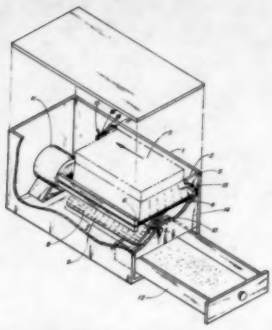
1. A chalkboard eraser cleaner, comprising:

an at least generally closed housing having wall portions;

a cylically moveable beater having impact members located in said container;

drive means associated with said beater for forcefully moving it; and

flexible mesh netting means supported by said wall portions and located adjacent to and above said beater for supporting the chalkboard eraser while it is being cleaned by impacts from said beater when it is moved, said beater impact members impacting the underside of said flexible



mesh netting means when said beater is forcefully moved by said drive means.

4,392,269

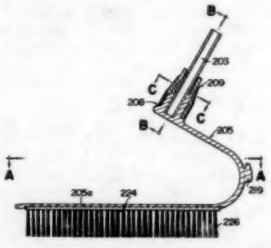
MOP CARRIER

Masanobu Nishiyama, Higashi; Fusao Kanazawa, Neyagawa; Hisaji Tanaka, and Tatsuo Nishimura, both of Osaka, all of Japan, assignors to Duskin Franchise Kabushiki Kaisha and Kabushiki Kaisha Sunpack, both of Osaka, Japan

Filed Mar. 5, 1981, Ser. No. 240,827

Int. Cl.³ A46B 17/02; A47L 13/24; B25G 3/04

U.S. Cl. 15—145 **3 Claims**



1. A mop carrier for removably mounting a mop and/or a brush to a mop handle;

said mop carrier comprising:

an elongated, continuous resilient blade including a first portion which at one end leads into a second, arcuate portion which at one end leads into a third, straight portion which is longer than said first portion and generally horizontal;

said first portion spacedly overlying said third portion;

means integrally providing an upwardly projecting cylindrical boss upon said first portion distally of said second portion, said boss having means defining an upwardly opening socket therein of a diameter to receive a mop handle lower end, said boss including a lower, barrel portion provided with a band of external threading, and being longitudinally split above said barrel portion into a plurality of angularly adjacent petals;

an internally threaded collar constructed and arranged to thread onto said boss and to radially inwardly urge said petals;

means providing a hook outwardly projecting on said second portion, said hook being constructed and arranged to detachably hold a mop loop for removably holding a mop sleeved on said third portion of said mop carrier resilient blade; and

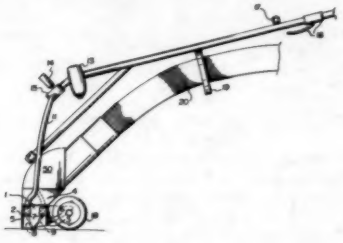
means providing a laterally directed flange means about two sides and an outer end of said third portion, whereby said third portion is constructed and arranged to longitudinally slidingly, removably receive a brush.

4,392,270

SURFACE CLEANING APPARATUS

S. Jim Magee, Coquitlam, Canada, assignor to Magee Enterprises Ltd., Coquitlam, Canada

Filed May 11, 1981, Ser. No. 262,255
Claims priority, application Canada, Jun. 9, 1980, 353588
Int. Cl.³ E01H 1/08, 1/10
U.S. Cl. 15—322 16 Claims



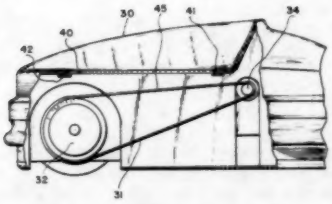
1. A surface clearing apparatus comprising a vacuum chamber having an open bottom and an upper exhaust port, and high pressure liquid jet spraying means mounted within the chamber a predetermined height above the bottom thereof, the spraying means being comprised of a plurality of high pressure spray heads mounted along one of the front or rear of the vacuum chamber each adapted to emit a fan shaped spray at an angle toward the surface to be cleaned and being directed away from the adjacent front or rear of the chamber coextensive and noninterfering with the spray from an adjacent spray head, so as to form a substantially ungapped transverse line across the chamber along said surface.

4,392,271

ELECTRIC VACUUM CLEANER WITH WINDOW FOR VIEWING BELT

Arnold L. Sepke, Lake Bloomington, Ill., assignor to National Union Electric Corporation, Bloomington, Ill.

Filed Sep. 21, 1981, Ser. No. 303,715
Int. Cl.³ A47L 9/00
U.S. Cl. 15—339 8 Claims



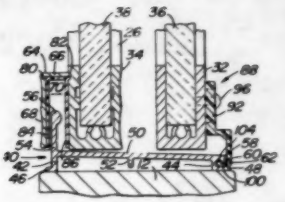
1. In a vacuum cleaner having a housing enclosing at least upwardly a beater brush rotatable about a horizontal axis, a motor, and a belt transmitting rotary motion from said motor to said beater brush; the improvement wherein said housing is opaque for the greater part thereof, and has a transparent window fixedly mounted therein to enable a portion of said belt to be viewed from externally of said housing, said belt having distinctive markings thereon, whereby its speed of movement or lack of movement, and regularity of movement, can be observed through said window.

4,392,272

TRACK AND PANEL GUIDE FOR SLIDING SHOWER DOORS OR THE LIKE

Abram R. Finkel, Royal Palm Beach, Fla., assignor to KSD Industries, Inc., Southampton, Pa.

Filed Feb. 17, 1981, Ser. No. 234,859
Int. Cl.³ A47K 3/14; E05D 13/02
U.S. Cl. 16—95 R 13 Claims



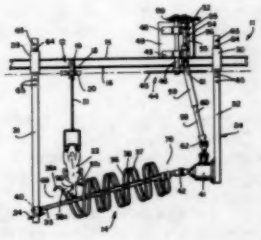
1. Guide means for shower doors and the like having respective inner and outer sliding doors comprising: an elongated lower track member, a planar upper face inclined downwardly from an outer to an inner edge of said track member, a guide rail projecting upwardly from said upper face adjacent to said outer edge, and a partly enclosed horizontally opening guide channel disposed along the inner edge of said track member, first guide members coupled to the inner sliding door, said first guide members having a horizontally extending portion adapted to project into said guide channel and a terminal enlargement interengageable with said guide channel to slidably secure the inner sliding door to said lower track member, and a second guide member associated with the outer sliding door, said second guide member comprising a downwardly opening channel adapted to overlie and interengageably receive said guide rail.

4,392,273

POULTRY PROCESSING APPARATUS

Horace J. De Long, Garrison Rd., Rte. 6, Box 257A, Macon, Ga. 31201

Division of Ser. No. 68,204, Aug. 20, 1979, Pat. No. 4,336,633.
This application Jun. 29, 1982, Ser. No. 393,247
Int. Cl.³ A22C 21/00
U.S. Cl. 17—12 8 Claims



1. Apparatus for processing poultry for use in a poultry processing line of the type including conveyor means for moving a plurality of birds suspended in an inverted attitude in series through a plurality of processing steps, said apparatus comprising a support frame, a rotary element comprising a pair of helical, coaxial overlapping bars mounted on a common axle, said axle rotatably mounted on said support frame, said pair of helical bars defining an open-ended helical path there-

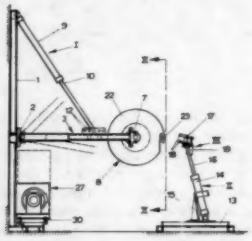
between for receiving the necks of birds on the conveyor means, and drive means in driving engagement with said axle for connection to the conveyor means for rotating said helical bars in response to the movement of the conveyor means and conveying the necks of the birds.

4,392,274

APPARATUS FOR PULLING-OFF THE SKIN OF SHEEP CARCASSES IN SLAUGHTERING

Terje Noroy, Tronerudveien 17, N-3550 Gol, Norway

PCT No. PCT/NO80/00022, § 371 Date Mar. 3, 1981, § 102(e) Date Mar. 3, 1981, PCT Pub. No. WO81/00040, PCT Pub. Date Jan. 22, 1981
PCT Filed Jul. 4, 1980, Ser. No. 247,531
Claims priority, application Norway, Jul. 6, 1979, 792255
Int. Cl.³ A22B 5/16
U.S. Cl. 17—21 8 Claims



1. An apparatus for pulling-off the skin of sheep, lamb or similar carcasses in connection with slaughtering, comprising an essentially horizontal drum which is arranged to pull off the skin during winding thereof on the drum, the drum being moved along the dorsal side of a vertically suspended carcass characterized in that the drum (8) has a gradually increasing diameter from the central portion (20) towards both ends and a clamping means to affix the skin to the drum at the beginning of the cycle, said drum being mounted at the free end of a pivotable beam (3) which is provided with a means (9) for pivoting movement of the beam during the pulling-off operation, along and in engagement with the dorsal side of said carcass and that there is provided a means (24) for rotation of the drum (8), said drum (8) being rotated synchronously with the pivoting movement of the beam (3) and with a speed which is adapted to the pivoting movement of the beam traversing said dorsal side of said carcass whereby varying amounts of force at varying angles are exerted on the skin responsive to the locus of the drum along the carcass, to most effectively and uniformly carry out the skin removal process with minimal damage to the skin.

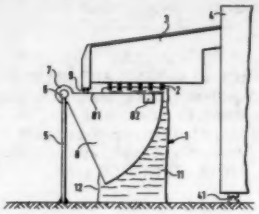
4,392,275

APPARATUS FOR SUPPORTING FIBER BALES

Ferdinand Leifeld, Kempen; Hans-Jürgen Marx, and Rolf Scheuermann, both of Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,694
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010937
Int. Cl.³ D01G 7/06
U.S. Cl. 19—81 17 Claims

1. In a bale supporting apparatus for stabilizing fiber bales during opening of the fiber bales from the top; the apparatus including a support element arranged to engage a vertical end face of a bale and further arranged for stepwise, vertically downwardly oriented motion as the bale height decreases during the bale opening process; the improvement comprising a stationary carrier structure situated horizontally adjacent the space occupied by the fiber bales undergoing opening and



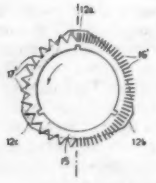
mounting means for movably securing said support element to said carrier structure.

4,392,276

FIBER SEPARATOR FOR FEEDING A FREED-FIBER SPINNING UNIT

Roger Gauvain, Buhl, and Michel Kueny, Brunstatt, both of France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse, France

Filed Apr. 1, 1981, Ser. No. 249,988
Claims priority, application France, Apr. 4, 1980, 80 07652
Int. Cl.³ D01H 1/12; D01G 19/10, 15/14
U.S. Cl. 19—97 11 Claims



1. A device for separating individual fibers of a sliver, comprising:

means for feeding the sliver;

means adjacent said feeding means for opening the sliver, comprising a combing and drafting cylinder, said combing and drafting cylinder being constituted by a shaft having a stack of disks mounted thereon, the edges of said disks having teeth or needles for combing the sliver and smooth portions on the periphery thereof for drafting the sliver, said disks being relatively angularly offset from one another, a pressure roller in close proximity to said combing and drafting cylinder;

a guiding means mounted between said feeding means and said combing and drafting cylinder; and

fiber discharging duct means positioned downstream of said opening means.

4,392,277

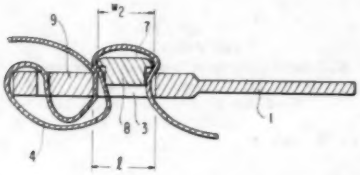
LOCK TONGUE FOR SAFETY BELTS

Manfred Müller, Deizisau, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,360
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021387
Int. Cl.³ A44B 11/10
U.S. Cl. 24—196 6 Claims

1. A lock tongue for a safety belt system, comprising two passage openings for accommodating a belt strap of the safety belt system, a central web means for separating the two passage openings, and clamping means adapted to be attached in one of the passage openings for clamping the belt strap, the

clamping means extending along an entire longitudinal extension of the passage opening so as to rest on both sides in marginal zones of the lock tongue adjoining narrow sides of the passage opening so that the clamping means supports the belt strap extended therearound when the clamping means is in the passage opening, the belt strap passes through the passage openings so that the lock tongue is firmly attachable in a certain location of the belt strap due to a loop around friction occurring under load, the attachment of the lock tongue is effected by repeated deflection of the belt strap by the clamping means, the clamping means includes a clamping bracket having a base portion and a head portion, the head portion has a width wider than a width of the base portion such that the bracket has an approximately mushroom-shaped cross section, the base portion is adapted to be inserted into the passage opening, the width of the base portion is less than the length of the narrow sides of the passage opening by about three times a thickness of the belt strap, a width of the head portion corresponds approximately to the length of the narrow sides of the passage opening, and means are provided for attaching the clamping bracket to the lock tongue.

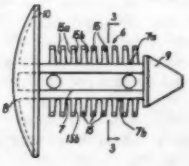


4,392,278

FASTENER

Peter R. Mugglestone, Ormond, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 27, 1981, Ser. No. 239,224
Claims priority, application Australia, Feb. 20, 1980, PE2462
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—213 R **8 Claims**



1. A reusable fastener of the one-piece push-in type having a longitudinal axis and laterally extending fronds on a shank to inhibit withdrawal of the fastener shank when inserted into a preformed hole, said fastener shank being generally H-shape in cross-section with opposite side faces and adapted to fit neatly within a hole into which the fastener is to be fitted, a plurality of axially spaced fronds on each said opposite side face of the shank to form two rows of fronds in opposed relationship, said fronds being resilient and adapted to engage the inner wall of said hole to resist withdrawal of the fastener therefrom, a head at one end of the shank, whereby when said fastener is positioned in said hole said H-shape shank centrally locates said longitudinal axis of said fastener relative to the central axis of said hole thereby insuring engagement of both rows of fronds with said inner wall of said hole.

4,392,279

SELF-LOCKING TWO-PART FASTENER

Frederic A. Schwager, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 14, 1981, Ser. No. 301,495
Int. Cl.³ A44B *21/00, 1/38;* A63H *3/38*
U.S. Cl. 24—221 R **6 Claims**

2. A self-locking two-part fastener, comprising:

a first fastener part including a first base and a spindle upstanding from said first base;

a second fastener part including a second base and a hollow tubular member upstanding from said second base, and

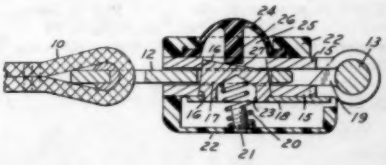
means for locking said hollow tubular member to said spindle and said first base, said locking means including a resilient stop member on said first base, a cam face on said spindle, a protuberance extending from said hollow tubular member and a shoulder provided on the inner wall of said tubular member, whereby said spindle may be inserted into said hollow tubular member and rotated with respect thereto until said cam face and said shoulder force said protuberance into locked engagement with said stop member, said stop member being formed integrally with said first base and comprising a resilient finger mounted in an arcuate opening in said first base, said opening being of greater extend than said finger, whereby said protuberance may be trapped in said opening by the free end of said finger.

4,392,280

CLEVIS SAFETY BELT BUCKLE

James A. Gavagan, Centerline, Mich., assignor to Irvin Industries, Inc., Madison Heights, Mich.

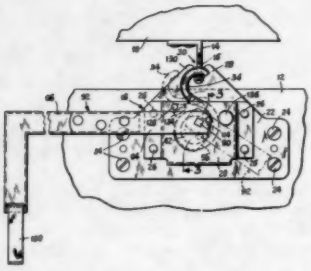
Filed Jan. 30, 1981, Ser. No. 229,883
Int. Cl.³ A44B *11/26*
U.S. Cl. 24—230 A **17 Claims**



1. A safety belt buckle comprising a connector tongue adapted for attachment to a first belt end, a housing having a base, clevis means mounted within said housing extending, longitudinally as an aligned tension element on both sides of said tongue with a transverse closed end adapted for attachment to a second belt end, alignable apertures in said connector tongue and both adjacent sides of said clevis means, latch means extending upwardly from the base through said apertures engaging said tongue and both sides of said clevis means, resilient means mounted within said housing normally retaining said latch means in engaging position, and exposed manually actuable means for moving said latch means downwardly

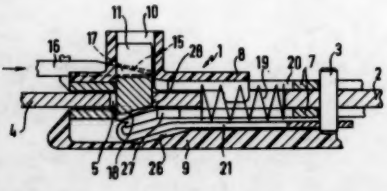
relative to both clevis and tongue to a position for disengaging said connector tongue.

4,392,281
RELEASABLE FASTENER
Joseph R. Metz, Ridgefield, and Michael F. Barnes, Sandy Hook, both of Conn., assignors to Norco, Inc., Ridgefield, Conn.
Filed Feb. 6, 1981, Ser. No. 232,097
Int. Cl.³ A43C 11/08; A44B 13/00
U.S. Cl. 24—230.5 R 13 Claims



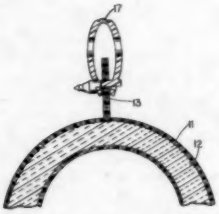
1. In a releasable, hook-type fastener, in combination:
(a) a drive shaft,
(b) means for turnably mounting said shaft on equipment which requires fastening,
(c) an eccentric bushing turnable with said shaft,
(d) a pair of separate and distinct, similarly-shaped spring hooks disposed side-by-side and substantially in broadside contact with each other, having looped bearing portions frictionally and slidably engaged with the eccentric bushing and having laterally-registered coextensive bill portions aligned with each other and directed in the same direction, and
(e) means separate from said spring hooks and held captive thereby and disposed adjacent the eccentric bushing, said means being engageable and movable with said hooks to continually maintain the same in registration with one another.

4,392,282
LOCK FOR SAFETY BELTS
Franz Wier, Göggingen, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk, Alfdorf, Fed. Rep. of Germany
Filed Mar. 3, 1981, Ser. No. 240,154
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008298
Int. Cl.³ A44B 11/16
U.S. Cl. 24—230 AL 16 Claims



1. Lock for a safety belt comprising a belt lock with spaced plates defining an insertion path, a plug-in tongue for insertion in the insertion path, a latch movable transversely to the insertion path to the locked position in which the latch is interposed in the path of the tongue and to the open position in which the latch does not block passage of the tongue in the insertion path, a manually operated pressure element to move the latch from the locked position to the open position, spring means retaining the latch in the open position when the tongue is withdrawn from the insertion path, and an insertion lock in the belt lock activated by a pulling force on the plug-in tongue exceeding a predetermined value to restrain said spring means to permit withdrawal of the tongue from the insertion path and prevent renewed insertion after such withdrawal.

4,392,283
GROMMET CLIP
David R. Timmons, Newport Beach, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.
Filed Oct. 31, 1980, Ser. No. 202,641
Int. Cl.³ A44B 21/00
U.S. Cl. 24—255 SL 2 Claims

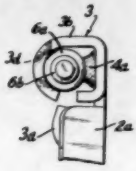


1. In combination with a penetratable web, a grommet clip for penetrating said web and providing hanger means therefor comprising:
(a) a flat body having first and second portions adapted to be brought together along a single fold line thinner than the remainder of the body in one predetermined overlapping position,
(b) a connecting hole in the first body portion remote from the fold line,
(c) a pointed snap-in pin projecting from the second body portion remote from the fold line for forcibly penetrating the web and the connecting hole when the body portions are in said overlapping positions to lock the body portions together about the penetrated web,
(d) finger guard extension means integral with said first body portion and projecting outwardly from that side of the flat body opposite the projecting pin for preventing finger contact with the pointed pin as the body portions are locked together about the penetrated web, and
(e) first and second eyelet holes located in the respective body portions which are aligned to receive suspension means when the body portions are in said interlocked overlapped position.

4,392,284
WATCHBAND ENDPIECE WITH CAPTURING BEAD
Joseph R. LePage, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Jul. 20, 1981, Ser. No. 284,899
Int. Cl.³ A44C 5/18
U.S. Cl. 24—265 B 8 Claims

1. In a watch band endpiece construction, the combination of:
(a) tubular endpiece member having open ends and an access opening intermediate the ends,

(b) a resilient capturing bead deposited inside said endpiece member opposite the access opening therein, and



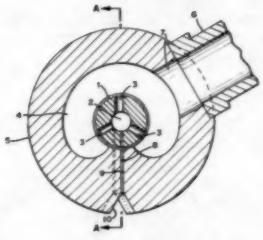
(c) a connector bar member retained inside said endpiece member by frictional engagement with said capturing bead.

4,392,285

DEVICE HAVING YARN PASSAGE OF SPECIFIED DIMENSIONS FOR INTERLACING FILAMENTS OF MULTIFILAMENT YARN

Wilbur L. Stables, Matoaca; David Pendlebury, Chester; Anthony M. Saich, Colonial Heights, all of Va., and Maxwell C. Hamlyn, Cary, N.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 19, 1981, Ser. No. 312,587
Int. Cl.³ D02J 1/08
U.S. Cl. 28—276 **4 Claims**



1. An improved apparatus for commingling multifilament yarn comprising an elongated body having

a straight yarn passageway passing through said elongated body, said yarn passageway having an effective diameter of from about ¼ inch to 5/16 inches;

at least three orifices substantially equally spaced about the periphery of said body at substantially the same level, said orifices having a diameter of from about 0.060 inches to 0.080 inches;

at least two of said orifices having an extended centerline offset to one side from the radius of a circle of the effective diameter of a cross section of said yarn passageway at the orifice level and at least one of said orifices centerlines offset in a direction counter to the said other offset orifices, and so that none of said extended centerlines intersect the center of said effective diameter also provided that the intersection of the extended centerlines forms a polygon which must have a side nearer to the center of said effective diameter than an apex, also provided that the polygon side must measure greater than 0.1 percent but less than 7.5 percent of the effective diameter, and said side must be at a distance greater than 0.1 percent but less than 5.0 percent of the effective diameter from the center of said effective diameter;

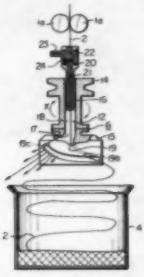
said orifices communicating with a source of high pressure fluid so that any yarn passing linearly through said passageway would have continuous filaments commingled with one another.

4,392,286

APPARATUS FOR TAKING UP A BUNDLE OF FILAMENTS

Satoshi Yakushiji; Atsushi Yamamoto, both of Matsuyama; Yukio Kitamura, Kobe, and Nobuo Yoshioka, Iwakuni, all of Japan, assignors to Teijin Limited, Tokyo, Japan

Continuation of Ser. No. 892,418, Mar. 31, 1978, abandoned. This application Jan. 30, 1981, Ser. No. 229,940
Claims priority, application Japan, Apr. 5, 1977, 52-38138
Int. Cl.³ B65H 54/82
U.S. Cl. 28—289 **17 Claims**



1. An apparatus for taking a bundle of filaments from a supply source thereof in a container, the apparatus including a rotary member mounted for rotation about a vertical axis and having a guide passage formed therein, the guide passage extending from an entrance opening coaxial with the vertical axis at the top of the rotary member to a discharge opening displaced downwardly and radially outward from the entrance opening, means for rotating the rotary member about the vertical axis in a predetermined direction, and an ejector for sucking in a bundle of filaments from a supply source and delivering the bundle of filaments in a stream of compressed air into the entrance opening of said guide passage for ejection from the discharge opening thereof along a spiral locus, wherein the improvement comprises:

said guide passage of the rotary member including a vertical upper portion extending from the entrance opening at the top of the rotary member; and

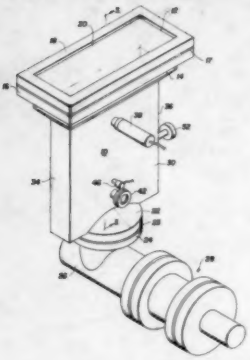
a lower portion comprising a gradually spreading passage having a front wall with respect to the rotational direction of said rotary member extending from a turning point at the lower end of the vertical upper portion to the discharge opening of the guide passage on a peripheral face of said rotary member and a rear wall extending downwardly and outwardly from said turning point at the lower end of the vertical upper portion, the position of said rear wall at said discharge opening being located below the position of said front wall at said discharge opening, the rear wall of said gradually spreading passage diverging smoothly and continuously from the front wall with increasing distance in the radial direction such that said filament-bundle is guided along the rear wall of said lower portion of the guide passage, while said compressed air stream is discharged along the front wall of said lower portion of the guide passage, whereby the discharged air stream is diverted from the path followed by the ejected bundle of filaments.

4,392,287

QUARTZ RESONATOR PROCESSING SYSTEM

Roswell D. M. Peters, Rustburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1980, Ser. No. 174,771
Int. Cl.³ H01L 41/22
U.S. Cl. 29—25.35 18 Claims



1. Apparatus for processing quartz crystal resonators in a relatively high vacuum environment, comprising:

a unitary processing chamber including means for evacuating said chamber during a multi-step fabrication procedure;

a rotatable resonator component holder, for at least one set of resonator components including a frame containing a resonator element, cover means therefore and a separator element for positioning cover means in spaced-apart relationship adjacent said frame, said holder being located in said chamber and removable therefrom;

means for rotating said holder past a plurality of processing stations;

means located at a first of said plurality of processing stations for applying a metallization pattern defining electrode means on said resonator element;

means located at a second of said plurality of processing stations for positioning said cover means on said frame including an actuator means for moving said cover means past said separator element and into registration with said frame; and

means located at a third of said plurality of processing stations for sealing said cover means on said frame to provide a hermetically sealed unit.

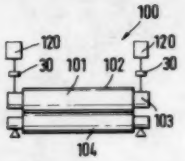
4,392,288

DEVICE FOR ACTION ON WEBS OF MATERIAL WITH AT LEAST ONE CYLINDER

Helmut Anstötz, Tönisvorst; Klaus Kubik, Krefeld, and Heinz Paulussen, Mönchengladbach, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,457
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024570
Int. Cl.³ B21B 13/14
U.S. Cl. 29—116 AD 10 Claims

1. In a device for acting on webs of material comprising: at least one roll, which comprises a revolving hollow cylinder constituting the working roll circumference; a crosshead going through the cylinder with spacing on all sides, and against which the hollow cylinder is braced by means of a fluid pressure medium contained in its interior between the crosshead and the inside of the hollow cylinder in at least one chamber; force members which operate in the action plane of the roll and engage the ends of the crosshead protruding from the hollow cylinder, or corresponding points of a counter roll; and a control for holding the forces exerted by the fluid pressure medium on the one hand and by the force members on the other hand substantially in equilibrium, the improvement com-



prising: force measuring cells inserted between the force members and the ends of the crosshead or the corresponding points of a counter roll, respectively, which cells substantially transmit the entire exerted force; and means for feeding the signal of said cells to the control.

4,392,289

MANUFACTURE OF JEWELRY BY CASTING WITH PRESET GEMS

Franck Michaud, Lyons, France, assignor to Charles Hoffert of America, Inc., Miami, Fla.

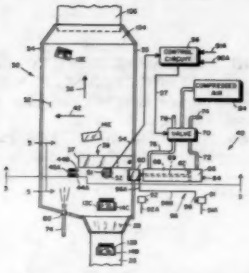
Filed Jun. 1, 1981, Ser. No. 268,780
Int. Cl.³ B22C 7/02, 9/04; B22D 19/00
U.S. Cl. 29—160.6 9 Claims

1. In the manufacture of an article of jewelry cast in precious metal by a lost wax procedure and having a seat in which a gem is preset, the gem having a girdle and the seat having a sidewall formed with opposing undercut grooves in which portions of the girdle engage as gem retention means, the method comprising the steps of molding a wax model having a seat with a sidewall formed with opposing undercut grooves, the wax model being formed from a wax having a predetermined resiliency enabling flexing of the sidewall of said seat, snapping a gem having said girdle into set position in said seat by application of downward pressure on the gem to resiliently flex said sidewall permitting portions of the girdle to enter into engagement with said opposing undercut grooves, mounting the wax model with the gem set in the seat on a wax tree, embedding the wax tree in investment material in a flask, raising the temperature of the flask by predetermined increments and time intervals to a predetermined temperature to remove the wax and cure the investment material providing a mold cavity with the gem suspended therein, injecting molten precious metal into the mold cavity to form a metal casting in which the girdle of said suspended gem is engaged by undercut grooves of the metal casting, cooling the flask and its contents, and breaking the investment material after the flask and its contents cool to remove the precious metal article with the gem preset in said seat.

4,392,290
APPARATUS SEPARATING HYBRID SUBSTRATE

Andrzej J. Krzeptowski, San Carlos, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Division of Ser. No. 129,508, Mar. 11, 1980, Pat. No. 4,327,472.
This application Oct. 26, 1981, Ser. No. 314,826
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—239 8 Claims



1. Apparatus for separating a leaded hybrid substrate from a heat conductive carrier plate that it is sitting on, the flat bottom of the substrate being contiguous with and stuck to the flat top surface of the plate by semi-liquid solder flux following a reflow solder operation, comprising:

a work table having a flat top, the flat bottom of the plate resting on the flat table top;

a stop member in a fixed position on the table top and projecting a prescribed distance above it that is less than the thickness of the plate;

first means for producing a first force in one direction in a plane that is generally parallel to the table top and positioned above the latter for being applied to a non-leaded edge of the substrate that is adjacent to a leaded side thereof rather than to the edge of a plate of a stacked pair thereof, the first force exerted on the edge of a substrate moving the plate of a stacked pair thereof against said stop member for restricting movement of the plate in the one direction so as to enable separation of the substrate and plate along the broad contacting surfaces thereof; and

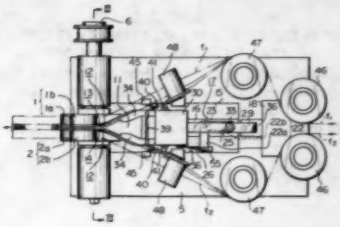
second means for releasing said stop member for allowing continued movement of the plate, or a flat part resting on the table top in the position of the plate, in the one direction when the force exerted on or translated to the plate or part by said first means and stop member exceeds a prescribed value.

4,392,291
METHOD FOR ASSEMBLING SLIDE FASTENER STRINGERS

Kenichiro Isi, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,094
Claims priority, application Japan, Sep. 25, 1980, 55-133479
Int. Cl.³ B21D *53/50*; B29D *5/00*
U.S. Cl. 29—408 7 Claims

1. An assembling apparatus for slide fastener stringers comprising a pair of laterally disposed feed rollers for feeding a pair of laterally disposed slide fastener stringers successively each having spaced sections where there are no scoops in continuous rows of scoops; a binder member fixedly positioned on the feeding side of said feed rollers for engaging said stringers; a pair of laterally disposed claws for protruding into the spaced sections of the stringers and engaging with the leading edges of scoop rows directly following said spaced sections; a differential transmission mechanism for retarding the rotational velocity of the one of said two feed rollers which feeds the leading stringer with which one of said two claws is engaged while accelerating the rotational velocity of the other roller until the leading edges of said two stringers are aligned with each other; said claws being adapted to come out from the spaced sections of the stringers when the leading edges of the scoop rows of the stringers are aligned; characterized in that a pair of laterally disposed detecting levers are provided to protrude into the succeeding spaced sections of said stringers as they arrive and

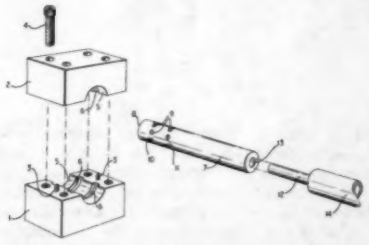


then to come out therefrom; and a detector is provided to detect the movement of the detecting lever so as to judge whether the engagement of the pair of stringers is proper and to produce either a signal to protrude the claw into the spaced section directly succeeding the detecting lever if the stringer alignment is proper or a signal to stop operating the feed roller if said alignment is not proper.

4,392,292
FORMING PROCESS

Ian B. Irons, Reading, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Jun. 5, 1980, Ser. No. 156,853
Claims priority, application United Kingdom, Jun. 6, 1979, 7919705; Jul. 19, 1979, 79/25205
Int. Cl.³ B21D *26/02*; B23P *17/00*
U.S. Cl. 29—421 R 6 Claims



1. A method for forming couplings or individual sockets from ductile metal comprising:

(i) inserting into a section of the ductile metal tubing a hollow mandrel having a blind end and containing one or more apertures, each aperture extending from the interior of the mandrel to the circumferential surface, the interior of the mandrel containing a plastic filler metal material;

(ii) holding at least an end portion of said section of tubing in support means, the end portion containing the mandrel, the said support means having a supporting surface adapted to contact substantially the entire periphery of said end portion and a cavity being provided in said supporting surface, the relative position of the mandrel within said portion of tubing to said support means being such that the apertures are substantially in registration with the cavity,

and

(iii) inserting into the open end of said hollow mandrel a ram to apply pressure to the said plastic filler metal material, forcing the said material through said apertures to distend that portion of said ductile metal tubing in registration with said cavity into said cavity, the interior or the resulting distension being thereby simultaneously provided with a deposit of plastic filler metal material.

4,392,293

METHOD OF ASSEMBLING COMBINATION SHOCK ABSORBER AND AIR SPRING

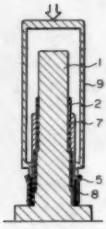
Kiyoshi Yamaguchi, and Naoki Makita, both of Yokohama, Japan, assignors to Tokico Ltd., Kanagawa, Japan

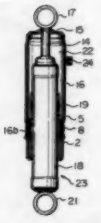
Filed Oct. 2, 1980, Ser. No. 193,104

Claims priority, application Japan, Oct. 8, 1979, 54/129769

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—436 **3 Claims**





1. A method of assembling a combination shock absorber and air spring including a tubular shock absorber having an outer tube and a piston rod reciprocably projecting from one end of the outer tube, and an air spring consisting of a resilient diaphragm member having an outer wall portion connected to a cylindrical housing secured to the projecting end of the piston rod, an inner concentric wall portion secured to the outer tube of the shock absorber, and a rolling wall portion formed between said inner and outer wall portions, the method comprising the steps of:

expanding radially outwardly and rolling back one end portion of a tubular resilient diaphragm member to form the outer wall portion and the rolling wall portion, while preventing deformation radially inwardly of the remaining portion of said resilient diaphragm member, said expanding and rolling back of said resilient diaphragm member being performed by fitting said resilient diaphragm member on a mandrel having steppingly increasing outer diameters, and displacing said resilient diaphragm member along said mandrel while abutting said one end portion of said resilient diaphragm member against a surface of said mandrel and thereby inverting said resilient diaphragm member;

fitting a retaining ring on the inner surface of the outer wall portion;

fitting the tubular resilient diaphragm member on the outer tube of the shock absorber;

securing the other end portion of the resilient diaphragm member to the outer tube of the shock absorber;

locating the free end of the outer wall portion of resilient diaphragm member in the cylindrical housing secured to the piston rod; and

securing the free end of the outer wall portion within the cylindrical housing by utilizing the retaining ring.

4,392,294

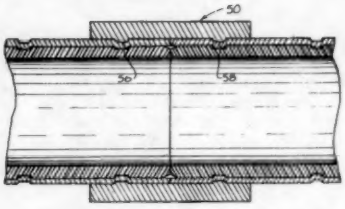
METHOD FOR MAKING POLYOLEFIN PIPE CONNECTOR SLEEVE

Steve Campbell, Manchester, Mo., assignor to Pipe Systems, Incorporated, Fenton, Mo.

Division of Ser. No. 144,668, Apr. 12, 1980, Pat. No. 4,310,184. This application Mar. 9, 1981, Ser. No. 241,568

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—451 **3 Claims**



1. A method for press-fitting an open ended tube-like metallic connector sleeve upon a compressible polyolefin pipe end which comprises performing a mechanical rolling or pressing operation on the exterior of the connector sleeve to simultaneously form an external groove and an underlying registering rib at a plurality of axially spaced locations along said sleeve to form a plurality of grooves and ribs axially aligning the connector sleeve having a plurality of circumferentially extending axially spaced internal ribs with an open ended polyolefin pipe end having a plurality of external circumferential grooves axially spaced from one another the same distance as the aforementioned axial spacing of the ribs of said connector sleeve, the external diameter of said pipe end being slightly greater than the internal diameter of said connector sleeve, forcefully moving said pipe end and connector sleeve toward one another to engage one another and causing said pipe end to be compressed and fitted within said connector sleeve and interfitting said ribs of the connector sleeve with the grooves of said pipe end to provide a mating relation and butting the fitted connector sleeve and pipe end to a like connector sleeve and pipe end and connecting the same by a sleeve-like coupling having internal ribs engaging the external grooves in the butted connector sleeves.

4,392,295

METHOD AND APPARATUS FOR FORMING DRUM SEAM

Mitsuo Sasai; Kiyozi Tomikawa, and Kazuo Kajiwara, all of Tokyo, Japan, assignors to Nittetsu Steel Drum Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,285

Claims priority, application Japan, Oct. 27, 1980, 55/149281; Dec. 4, 1980, 55/170203; Jan. 9, 1981, 56/1053

Int. Cl.³ B21D *39/00;* **B65D** *6/34*

U.S. Cl. 29—509 **9 Claims**

1. A method of forming a drum seam which comprises the steps of:

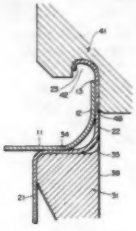
fitting a tray-like end plate, having a cylindrical portion forming an indented shape and an end plate flange formed

by the edge of the cylindrical portion extending outward from the edge of the cylindrical portion, into the end of a cylindrical drum body having a body flange extending outward from the edge of the cylindrical body perpendicular to the cylindrical axis of the body with said end plate flange overlapping and extending along and beyond the body flange;

fitting a seaming chuck having a cylindrical forming face into the tray-like end plate for holding the body and end plate together with the forming face of the seaming chuck against the inner surface of said cylindrical portion, and said seaming chuck having a fillet on the end adjacent the position where said end plate flange extends from said cylindrical portion, said fillet having an inclined surface extending from the forming face outwardly thereof;

rotating said seaming chuck for rotating the end plate and drum body around the cylindrical axis of the drum body; and

pressing a seaming roll having a circumferential forming groove therein opening toward the forming face of said



seaming chuck radially inwardly toward the forming face of the seaming chuck for engaging the flanges and bending them over for interlocking them and forming them into a seam, the bending comprising circularly curving the body and end plate flanges along a first circular cross-sectional portion of the forming groove, then further circularly curving the body and end plate flanges along a second circular cross-sectional portion of the forming groove having a smaller radius of curvature than that of the first circular cross-sectional portion, repeating the two step curving actions on successively more radially inward portions of the flanges until the body and end plate flanges form a seven-fold seam, the inclined surface of the fillet facing the second circular cross-sectional portion of the forming groove diagonally across the seam being formed and supporting the corners of the flanges where they bend from the drum body and the cylindrical portion, respectively, and finally pressing the formed seam between the forming face of the seaming chuck and the bottom of the forming groove in the direction of the radius of the drum.

4,392,296

METHOD OF JOINING TWO METAL MEMBERS

Hisanobu Kanamaru; Akira Tohkairin, both of Katsuta; Hideo Tatsumi, Mito; Naotatsu Asahi, Katsuta, and Mitsuo Haginoya, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,442

Claims priority, application Japan, Oct. 5, 1979, 54-129290

Int. Cl.³ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—520 **15 Claims**

1. A method of joining two metal members, each having a joining surface arranged in such a manner that the joining surfaces of the two metal members are in spaced juxtaposed relation, by way of a third metal member comprising the steps of:

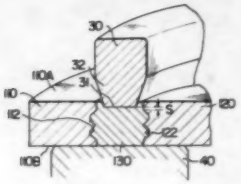
forming an annular groove on each of said joining surfaces of said two metal members;

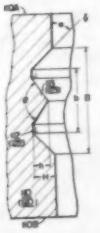
inserting a metal ring, of which said third member is comprised, in a gap defined between the joining surfaces of said two metal members; and

applying pressure to said connecting ring to cause part of the material thereof to flow into said annular groove, to form a joint; wherein the improvement comprises the steps of:

forming in each of said annular groove, simultaneously with or after forming said annular groove, at least one annular angled member having a height h that is substantially smaller than the depth H of said annular groove in accordance with the relationship $\frac{1}{4}H \leqq h \leqq (\frac{1}{2})H$ and being substantially triangular in shape in axial cross section.

6. A method of joining two metal members, each having a joining surface, one of said metal members having a higher deformation resistance than the other, comprising the steps of:





forming an annular groove on the joining surface of the one of said two metal members having higher deformation resistance; arranging the two metal members in such a manner that the joining surfaces of the two metal members are in juxtaposed relation; and applying pressure to the other metal member of lower deformation resistance to cause part of the material thereof to flow into said groove to form a joint;

wherein the improvement comprises the step of:

forming in said annular groove, simultaneously with or after forming said annular groove, at least one annular angled member having a height h that is substantially smaller than the depth H of said annular groove in accordance with the relationship $\frac{1}{4}H \leqq h \leqq (\frac{1}{2})H$ and being substantially triangular in shape in axial cross section.

4,392,297

PROCESS OF MAKING THIN FILM HIGH EFFICIENCY SOLAR CELLS

Roger G. Little, Bedford, Mass., assignor to Spire Corporation, Bedford, Mass.

Division of Ser. No. 209,541, Nov. 20, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,172

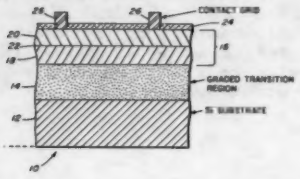
Int. Cl.³ H01L *31/18*

U.S. Cl. 29—572 **9 Claims**

1. A process of forming a high efficiency single-crystal, thin film, homojunction gallium arsenide solar cell on a single-crystal silicon substrate comprising:

(a) forming a single-crystal silicon substrate;

(b) forming a graded transition region on said substrate by deposition of a thin layer of germanium directly on said silicon substrate and pulsing said layer with an electron beam to effectuate thereby zone refining and mixing of said germanium layer and said silicon substrate;
(c) epitaxially growing a thin gallium arsenide film on said transition region;



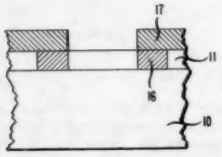
(d) doping said thin gallium arsenide film with one dopant species;
(e) forming a homojunction in said thin, doped gallium arsenide film by introducing therein a second dopant species; and
(f) forming front ohmic contacts on said gallium arsenide film.

4,392,298

INTEGRATED CIRCUIT DEVICE CONNECTION PROCESS

Robert A. Barker, Plainfield, and Edith C. Ong, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 27, 1981, Ser. No. 287,439
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—577 C **4 Claims**



1. The method of forming electrical connections in an integrated circuit device comprising the steps of
preparing an integrated circuit device comprising a silicon chip which includes a dielectric coating,
providing a two-level photosensitive masking layer over the dielectric coating of which the first level is sensitive to ultraviolet light and the second level is sensitive to visible light,
patterning said masking layer in accordance with the pattern of openings desired in the dielectric coating to permit connection therethrough by first irradiating with visible light and patterning the second level and then irradiating with ultraviolet light and patterning the second level,
making openings in said coating in accordance with the pattern by reactive ion etching to provide substantially vertical sidewalls in the openings,
depositing a conductive layer over the masking layer and in the openings in the dielectric coating of a thickness substantially to match the thickness of the dielectric coating,
dissolving the masking layer, thereby lifting off the overlying portion of the conductive layer, while leaving a plug portion of the conductive layer in the opening in the dielectric coating, and
forming over the dielectric coating a conductive layer which makes low resistance connection to the plug portion.

4,392,299

METHOD OF MANUFACTURING LOW RESISTANCE GATES AND INTERCONNECTIONS

Joseph M. Shaw, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 8, 1981, Ser. No. 223,493
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—590 **4 Claims**

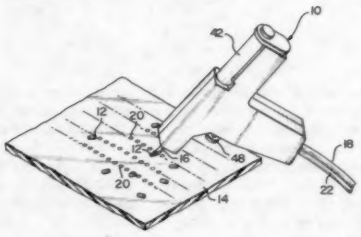
1. A process for forming a low resistance refractory metal silicide on a substrate comprising the steps of:
positioning the substrate in a reaction chamber maintained at a first temperature;
depositing, in a single low pressure chemical vapor deposition step, a composite of a refractory metal and silicon on the substrate by simultaneously passing a gaseous mixture of both a refractory metal carbonyl and silane gas through the chamber and over the substrate; and
heating the composite in a non-oxidizing atmosphere to a second temperature, higher than the first temperature, to form the silicide of the metal.

4,392,300

APPLICATOR TOOL FOR LOOSE MINIATURE SPRING SOCKETS

Timothy B. Billman, Carlisle, and Jon F. Kautz, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 22, 1981, Ser. No. 313,544
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—739 **2 Claims**



1. An application tool for picking up a loose miniature spring socket and inserting it into a hole in a printed circuit board, the tool comprising:
a. a frame consisting of a handle depending from a elongated perpendicular member;
b. control means in the handle with trigger means for activating the control means;
c. a nozzle at the forward end of the perpendicular member;
d. a reciprocating ram mounted in the perpendicular member and extending into the nozzle;
e. driving means to drive the ram, said means being controlled by the control means; and
f. means to supply a vacuum to the nozzle so that a socket is drawn into the nozzle and retained there so that the ram may be driven forward by the driving means to drive the socket out of the nozzle and into a hole in a printed circuit board.

4,392,301

DEVICE FOR INSERTING AND REMOVING CIRCUIT MODULES WITH MULTIPLE LEADS

John S. Hannes, Lisle, and Robert V. Harringer, Joliet, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

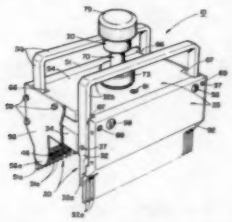
Filed Jun. 1, 1981, Ser. No. 268,612
Int. Cl.³ H05K *13/04, 3/30*
U.S. Cl. 29—741 **11 Claims**

1. A device for selectively inserting the leads of circuit

modules into and withdrawing them from lead-engaging sockets secured to an associated substrate, said device comprising:

a gripping jaw assembly including a support member and a mutually disposed pair of gripping jaws, means mounting said jaws pivotally on said support member and spring means for biasing said jaws in a direction toward each other, with each of said jaws having a corresponding notch formed in the inner surface thereof for receiving and supporting a peripheral edge portion of a circuit module when positioned between and gripped by said jaws;

a stationary support assembly including a mutually disposed pair of sidewall members for receiving the gripping jaw assembly therebetween, each of said sidewall members having a downwardly extending finger positioned adjacent a different one of said gripping jaws, and being formed at the lower end thereof to be selectively supported on an aligned socket, even when the socket is



positioned beneath the associated jaw, and on an associated socket-supporting substrate,

means on said sidewall members for engaging the gripping jaws to hold said gripping jaws against said biasing means in position adjacent to said fingers, and for linear movement relative to said fingers;

means extending from said jaws for pivoting said jaws away from said engaging means and against said biasing means to move said jaw notches away from each other to receive the peripheral edge at the circuit module; and

an actuable mechanism mounted on said stationary support assembly, coupled to said gripping jaw assembly, and having means moveable, in one of two directions, to impart precisely controlled linear displacement of said gripping jaws, and a given circuit module when clamped therebetween, in a related direction relative to said stationary support assembly while said fingers engage and hold the sockets.

4,392,302

METHOD OF MANUFACTURING A MOVABLE CONTACT MEMBER

Shigemasa Saito, Gyoda, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Dec. 23, 1980, Ser. No. 219,992

Claims priority, application Japan, Dec. 31, 1979, 54-172073

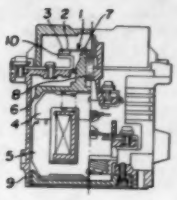
Int. Cl.³ H01R *43/02*

U.S. Cl. 29—879 **6 Claims**

1. A method of manufacturing a movable contact member formed from a flat spring and a contact tip bonded to it, which comprises the steps of:

age-hardening to a one-half hard temper a solution-treated age-hardenable copper alloy that is to be used as the material of the flat spring,

grinding the surface of the age-hardened spring material,



applying a rust-preventing film to the spring material, and bonding the contact tip to the spring material.

4,392,303

ONE-PIECE RAZOR HANDLE

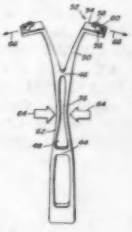
John T. Ciaffone, Bridgeport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 108,742, Dec. 31, 1979, abandoned.

This application Aug. 5, 1981, Ser. No. 290,263

Int. Cl.³ B26B *21/52*

U.S. Cl. 30—85 **1 Claim**



1. In a razor system of the type including a separable blade cartridge having one or more blades each having a single cutting edge, said cartridge being formed with ribs having apertures and a slide, said cartridge being operable dually and selectively to make a pivotal connection with a handle having fingers or stub shafts insertable in said apertures and to make a sliding connection with a handle having a track for engaging said slide;

an improved plastic handle structure providing an alternative connection with said blade cartridge: comprising a pair of flexible arms joined to define a yoke, each yoke formed with a stub shaft operable to engage a mating aperture in said cartridge ribs and pads individual to each arm adjacent each stub shaft cooperating with mating ribs on said cartridge to block pivoting of the cartridge.

4,392,304

UNIVERSAL MANUAL GRAFTING DEVICE

Laszlo Plesa, Szentendre, Hungary, assignor to Arasykalasz Mgtsz, Rackeve, Hungary

Filed May 14, 1981, Ser. No. 263,604

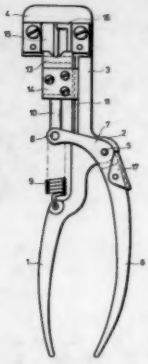
Claims priority, application Hungary, May 20, 1980, 1254

Int. Cl.³ A01G *1/06*

U.S. Cl. 30—178 **4 Claims**

1. A cutting tool for grafting comprising first and second members pivotally interconnected at a common pivot, each member including a handle portion on one side of the pivot and a working portion on the other side, the working portion of the second member being connected with the handle portion of the first member via a spring and being also pivotally connected

with one end of an arm whose other end is pivotally joined with a movable workpiece locating member slidably guided



along the length of the working portion of the first member toward and away from a cutting edge attached to the first member.

4,392,305

PENCIL SHAPED MAGNETIC COATING THICKNESS GAUGE

Hans Nix, and Herbert Szary, both of Cologne, Fed. Rep. of Germany, assignors to Elektro-Physik Hans Nix & Dr. Ing. E. Steingroever, K.G., Cologne, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 263,041

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025783; Jul. 8, 1980, 8018275[U]

Int. Cl.³ G01B 7/06

U.S. Cl. 33—169 F **17 Claims**

1. Magnetic coating-thickness gauge for measuring the thickness of a non-magnetic coating on a ferromagnetic substrate of the type wherein a permanent magnet is suspended by spring means for axial movement within a tubular housing resembling a pencil, said housing being provided with an axially extending slot, the magnet having a pole surface for contact with a coating to be measured on said substrate through an opening at one end of the housing, manually operable slide means encircling the exterior of the housing for slidable movement along the length of the housing in a generally straight line, connecting means extending through said slot between the slide means and spring means to permit the slide means to exert increasing force on said magnet when the slide means is moved away from said one end of the housing to dislodge the magnet from said coating and scale means on said housing with said slide means to denote coating thickness as a function of the force exerted on said magnet, said slide means including friction means engageable with a surface of the housing to hold the slide means in position when released by an operator of the gauge.

4,392,306

LETTERGUIDE

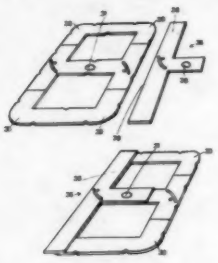
George A. Johnstone, P.O. Box 6, Grantham, Q.4347, Australia

Filed May 29, 1981, Ser. No. 268,582

Claims priority, application Australia, Jun. 9, 1980, PE03953

Int. Cl.³ B43L 13/20

U.S. Cl. 33—174 B **8 Claims**



1. A stencil comprising a substantially rectangular plate and a corner forming piece wherein the substantially rectangular plate consists of two regions of substantially equal surface area, each of said regions having an aperture located substantially centrally within the region, the substantially rectangular plate being provided with indication means proximal to its perimeter, wherein, at least one corner formed by the intersection of any two sides of the perimeter of the plate is a radiused corner and wherein the corner forming piece may be pivotally mounted on the rectangular plate and has at least one right angle corner formed on its perimeter such that one of the said radiused corner(s) of the said plate may have one of the said right angle corner(s) of the corner forming piece substantially superimposed thereover so as to form a right angle corner thereon.

4,392,307

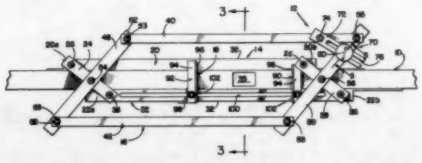
ADJUSTABLE FACE-PLATE TEMPLATE

William Wightman, Jr., 1034 Rimpau Ave., Corona, Calif. 91720

Filed Dec. 4, 1981, Ser. No. 327,363

Int. Cl.³ B27G 17/08

U.S. Cl. 33—197 **7 Claims**



1. An adjustable face-plate template for forming a recess in a door to receive a door-lock face-plate, the template comprising:

a clamping means defined by a first parallelogram structure adapted to be clamped to the longitudinal edge of a door;

a first guide means defined by a second parallelogram structure, said second parallelogram structure being operably connected to said first parallelogram structure, each struc-

ture thereof being independently adjustable relative to the other;

a second guide means adjustably mounted to said clamping means; and

locking means attached to said first guide means to secure said second parallelogram structure in its respective position relative to the forming of a specific recess configuration.

4,392,308

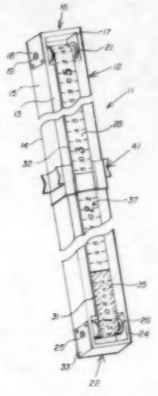
LEVEL ROD FOR GRADING

Theodore W. Case, 778 Center St., Wallingford, Conn. 06492

Filed Oct. 16, 1978, Ser. No. 951,600

Int. Cl.³ G01C *15/06*

U.S. Cl. 33—293 **10 Claims**



1. A device for use in grading operations for determining and visually indicating the depth of cut or fill required to establish a desired grade level in one place relative to grade level indicating means positioned in another place, the device comprising:

an elongated rod having front, rear and side surfaces;

an endless band extending longitudinally around said elongated rod along said front and rear surfaces, said endless band comprising a first band portion of a given color and having a first set of graduations ascending from zero at one end thereof to a first value at the other end thereof and a second band portion of a color clearly distinguishable from said given color and having a second set of graduations ascending from zero at one end thereof to a second value at the opposite end thereof, said one end of said first band portion being attached to said one end of said second band portion and said opposite end of said first band portion being attached to said opposite end of said second band portion;

mounting means supporting said endless band on said elongated rod and accommodating circumvolutionary movement therearound; and

a slide mechanism mounted for longitudinal sliding movement on said elongated rod, said slide mechanism comprising clamp means for selectively and alternatively either securing said slide mechanism to said endless band so as to prevent relative movement therebetween or releasing said slide mechanism from said endless band so as to allow relative movement therebetween, said slide mechanism while secured to said band being slidable longitudinally to establish generally horizontal alignment between said slide mechanism and said indicating means to visually indicate a length on said endless band between said zero and one of said graduations, said length corresponding to the depth of the required cut or fill.

4,392,309

APPARATUS FOR HEAT TREATING A CONTINUOUSLY MOVING WEB

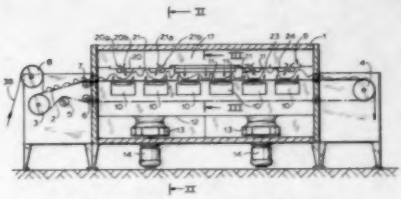
Alfons Schrader, Remscheid-Lennep, and Waldemar Schreiner, Wissen, both of Fed. Rep. of Germany, assignors to Babcock Textilmaschinen GmbH, Seevetal, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,974

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036669

Int. Cl.³ F26B *13/06*

U.S. Cl. 34—54 **8 Claims**



1. An apparatus for heat-treating an elongated textile web, comprising:

a gas-pervious conveyor belt having a stretch defining a treatment path having an upstream end and a downstream end;

means for feeding the web to said upstream end and for advancing said belt to advance said web toward said downstream end along said path;

a plurality of upwardly directed lower slot nozzles underneath said stretch along said path, said lower nozzles being generally perpendicular to said path;

a plurality of downwardly directed upper slot nozzles above said stretch along said path, said lower slot nozzles being transverse to at least some of said upper slot nozzles;

means for feeding a hot gas alternately to said upper and lower nozzles; and

a plurality of distribution boxes supporting said stretch and each formed with two such lower nozzles, some of said upper nozzles extending generally parallel to said path and the balance of said upper nozzles extending transverse to said path.

4,392,310

DRYING APPARATUS

Charles M. Hohman, Granville; Mark A. Propster, Gahanna, and Stephen Seng, Bladensburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 18, 1981, Ser. No. 274,968

Int. Cl.³ F26B *17/32*

U.S. Cl. 34—172 **9 Claims**

1. A particulate dryer comprising:

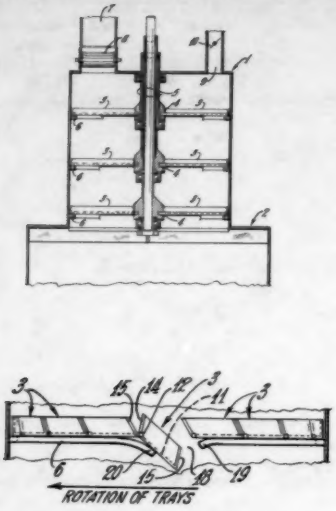
(a) a vessel having a gas inlet and outlet and a particulate inlet and outlet;

(b) at least one porous tray positioned within said vessel and adapted for horizontal rotation within said vessel, said tray comprising a plurality of sections, each of said sections comprising upstanding walls comprising a leading wall, a trailing wall, an inner wall and an outer wall, said inner wall, said outer wall, and said trailing wall each being separate from said leading wall and each fixedly attached to a porous bottom surface, and a hinged support affixed to the leading edge of said section, said section leading edge comprising the bottom part of said lead wall and the leading part of said porous bottom surface;

(c) an inward rotatable support and an outer discontinuous support of said sections; and,

(d) means for rotating said tray within said vessel to sequentially superimpose said sections above the discontinuous

portion of said outer support and to pivot said sections, exclusive of said leading wall, downwardly at said discontinuous portion to discharge particulate matter from said section.



4,392,311

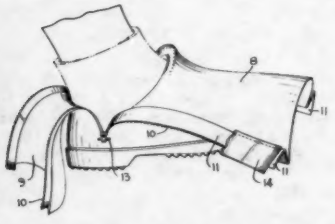
EXPANDABLE OVERSHOE

Warren P. Rudolf, and Susan A. Rudolf, both of 8210 Brandon Dr., Millersville, Md. 21108

Filed Aug. 3, 1981, Ser. No. 289,764

Int. Cl.³ A43B *1/10, 11/00*

U.S. Cl. 36—7.3 **7 Claims**



1. An overshoe comprising a sole having toe, arch, and heel portions and an upper secured to said sole, said upper comprising a forward portion extending from about said arch portion of the sole to the end of the toe and an ankle portion of flexible material extending from about said arch portion to the end of the heel portion and upward to below the knee of the wearer, said ankle portion being divided into front and back sections by two opposing longitudinal apertures each extending vertically on either side of said ankle portion from just about said heel portion to the top of said ankle portion to facilitate putting on or taking off the overshoe, each of said apertures being adapted to be closed by respective closure means extending the length thereof; the back section of said ankle portion being adapted when the apertures are open to provide means for grasping said overshoe from the rear further to facilitate pulling it on or removing it.

4,392,312

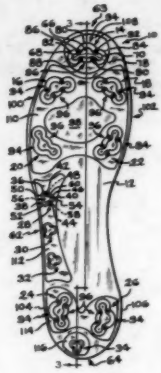
OUTSOLE FOR ATHLETIC SHOE

Kevin J. Crowley, Newburyport, Mass., and Channing Souther, Chesterfield, Mo., assignors to Converse Inc., Wilmington, Mass.

Filed Oct. 14, 1981, Ser. No. 311,484

Int. Cl.³ A43C *15/02*

U.S. Cl. 36—67 R **8 Claims**



1. An outsole for an athletic shoe, comprising:

a substantially planar outsole member having a plurality of projections therefrom;

said projections including a pluralty of first projections and a plurality of second projections, said second projections being longer than said first projections;

each said first projection having a shape characterized by three identical partially-overlapping frustoconical bodies, each having a major axis, said major axes being parallel to each other, said major axes defining the apexes of an equilateral triangle, said shape including fillet portions connecting the sides of said identical frustoconical bodies;

each said second projection having a shape characterized by three partially-overlapping frustoconical bodies of equal height and unequal volume, two said bodies being smaller than a third said body, said third body being disposed between said smaller bodies, each said body having a major axes, said major axes defining points on an arc, said shape including fillet portions interconnecting the sides of said frustoconical bodies, said shape defining a convex side and a concave side.

4,392,313

SHOE FOR USE WITH A CROSS-COUNTRY SKI

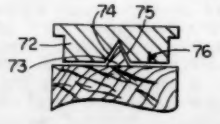
Josef Linecker, Rosengasse 5, A 5230 Mattighofen, Austria

Division of Ser. No. 892,770, Apr. 3, 1978, Pat. No. 4,235,452. This application Feb. 19, 1980, Ser. No. 122,698

Claims priority, application Austria, Apr. 13, 1977, 2578/77; Feb. 9, 1978, 924/78

Int. Cl.³ A43B *5/04, 13/12*

U.S. Cl. 36—117 **20 Claims**



1. A ski shoe for use with a cross-country ski having a web projecting from the ski surface and extending in the longitudinal direction of the ski, comprising a sole means of synthetic

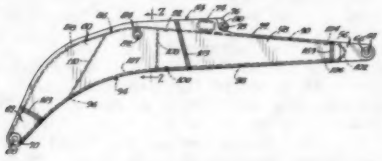
resin, the sole means including a heel portion defining a recess of V-shaped cross section extending in said direction for engaging the web and thereby holding the heel portion on the ski against lateral displacement, and upwardly projecting lateral edges arranged only forwardly of the heel portion.

4,392,314

BOOM AND DIPPER STICK CONSTRUCTION

Allan J. Albrecht, Rothschild, and Richard C. Van Ooyen, Schofield, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Feb. 16, 1982, Ser. No. 349,003
Int. Cl.³ E02F 5/02
U.S. Cl. 37—103 13 Claims



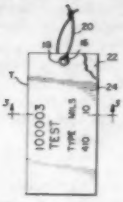
1. In an earth working vehicle having a self-powered frame structure, a platform supported on said frame structure, a boom having a first end pivotally secured to said platform about a substantially horizontal axis, a dipper stick pivoted intermediate its ends about a substantially horizontal axis to a second end of said boom, a material handling attachment pivoted to a first end of said dipper stick about a substantially horizontal axis, a first fluid motor means extending between said platform and an intermediate portion of said boom, a second fluid motor means extending between an intermediate portion of said boom and a second end of said dipper stick, and a third fluid motor means extending between an intermediate portion of said dipper stick and said material handling attachment; an improved boom construction comprising: a pair of spaced apart outside side plate assemblies, said outside side plate assemblies having front and rear connecting ear plates which have first and second bearing means respectively connected thereto for receipt of pivot pins to connect same respectively to said platform and said dipper stick, said side plate assemblies having front and rear side plates which are secured together in an end to end abutting relationship and secured between said connecting ear plates in an end to end abutting relationship, said front side plates having third bearing means mounted therebetween for pivotal receipt of said second fluid motor means, said rear side plates having fourth bearing means mounted therebetween for pivotal receipt of said first fluid motor means; a top plate assembly secured between the upper portions of said side plate assemblies; a bottom plate assembly secured between the lower portions of said side plate assemblies; an inside rear plate secured between said top plate assembly and said bottom plate assembly and said rear side plates rearward of said fourth bearing means; an inside forward plate secured between said top plate assembly and said bottom plate assembly and said rear side plates forward of said fourth bearing means; and a pair of spaced inside center plates secured between said inside rear plate and said inside forward plate so as to form a box structure therewith, said fourth bearing means extending through and secured to said rear side plates and said inside center plates.

4,392,315

DESTRUCTION AND DYE RESISTANT TAG; TAGGED TEXTILE ARTICLE AND METHOD OF IDENTIFYING TEXTILES SUBJECT TO A DYEING AND FINISHING PROCESS

William A. Irving, and Robert E. Thornton, Jr., both of Knoxville, Tenn., assignors to Standard Knitting Mills, Inc.

Filed Jan. 12, 1982, Ser. No. 338,960
Int. Cl.³ G09F 3/02; B32B 27/06, 27/34; D21D 3/00
U.S. Cl. 40—27 29 Claims



1. A method of identifying textile units subject to a chemical treatment process including dyeing of the unit comprising:

(a) applying color-contrast indicia directly onto an aramid paper layer of an abrasion and dye resistant tag,

(b) attaching the tag to a textile unit, the

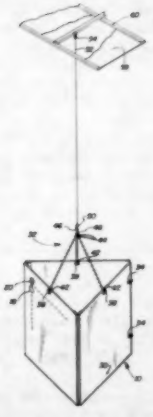
(c) subjecting said textile unit with said tag attached to the chemical treatment process for dyeing and treating said unit, said color-contrast indicia remaining visible after completion of said process and wherein said aramid paper layer consists essentially of a nonwoven, nonfused commingled mixture of floc of a nonfusable aromatic polyamide and fibrids of a nonfusable aromatic polyamide.

4,392,316

CEILING SUSPENDED PRODUCT DISPLAY

Paul D. Thomas, 208 S. College, McKinney, Tex. 75069

Filed Jan. 31, 1980, Ser. No. 117,108
Int. Cl.³ G09F 7/22, 15/00, 1/08; A47G 1/16
U.S. Cl. 40—617 35 Claims



1. A ceiling suspended product display comprising:

a plurality of display panels having sale product mounted thereon, each display panel further having at least one eyelet formed therein;

hinge means pivotally interconnecting said display panels at

adjacent edges of said display panels, said hinge means permitting said display to be folded in a compact form for storage or shipment with said display panels in facing relationship;

a ceiling hook connected to a ceiling;

suspension means suspending said display panels from said ceiling hook, said suspension means being connected to said display panels at said eyelets, said suspension means having swivel means permitting said display panels to rotate relative to said ceiling hook; and

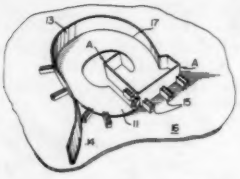
each of said display panels being pivotal about said hinge means to unfold said display with the edges of two of said display panels opposite the hinged edges abutting to form a multi-sided structure, the sale product being mounted on the side of each of said display panels facing outward when said display is unfolded, said display permitting said display panels to rotate relative to said ceiling hooks to attract attention, the multi-sided structure maintaining the product in view continuously during rotation.

4,392,317

SIGN LETTER CONSTRUCTION

Edwin F. Boothman, 117 Marion Dr., Sherwood Park, Alberta, Canada

Filed Jul. 1, 1981, Ser. No. 279,263
Claims priority, application Canada, Nov. 10, 1980, 364402
Int. Cl.³ G09F *7/02*
U.S. Cl. 40—618 **6 Claims**



1. A sign letter structure, comprising:

a first letter-form member, cut from a generally thin, rigid sheet material,

a second letter-form member, having an outer profile corresponding to that of the first letter-form member and cut from a lightweight, rigid sheet material,

a thin, pliable plastic strip material, having a lip on one edge, such strip material being bent around the periphery of the letter-form members so as to conform to the outer profile of those members, the thickness and depth of the lip being such that it readily deforms at sharp bends in the strip material, and

securing means for securing the first letter-form member to the interior side of the strip material at a position abutting the lip on the one edge thereof and the second letter-forming member to the interior side of the strip material near the other edge thereof, the members being maintained in parallel spaced relation.

4,392,318

SAFETY STRAP FOR HANDGUNS

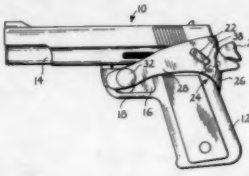
William J. Daniels, 3229 Wallace, Kansas City, Mo. 64129

Filed Sep. 15, 1981, Ser. No. 302,363
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—1 LP **10 Claims**

1. A safety strap arrangement for a handgun having a gun body and an exposed hammer that can be cocked to prepare the gun for firing, said safety strap arrangement comprising:

an elongate flexible strap adapted to be drawn around the gun body and having opposite ends positionable adjacent one another when the strap is drawn around the gun body in a taut condition;

means in a selected portion of said strap providing an opening in the strap adapted to fit over the hammer when same is cocked and the strap is applied to the gun and drawn around the gun body, said selected portion of the strap being located between the hammer and gun body to prevent firing of the hammer when said opening is fitted over the hammer; and



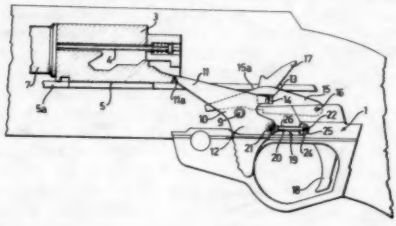
releasable fastening means for releasably fastening said opposite ends of the strap together to maintain the strap on the gun in a taut condition with said opening of the strap fitted over the hammer, thereby preventing firing of the gun until said fastening means is released and the strap is removed from the gun.

4,392,319

SAFETY DEVICE FOR THE TRIGGER MECHANISM OF A SHOT-GUN OF THE GAS-PUMP TYPE

Leonardo Ottolini, Brescia, Italy, assignor to Luigi Franchi S.p.A., Fornaci, Italy

Filed Oct. 20, 1981, Ser. No. 313,084
Claims priority, application Italy, Nov. 10, 1980, 25858 A/80
Int. Cl.³ F41C *11/06*
U.S. Cl. 42—69 B **3 Claims**



1. In a gas-pump-type shot gun having a firing chamber; a breechblock carrier supporting a breechblock for translational movement between a first position in which said firing chamber is closed and a second position in which said firing chamber is open; a trigger mechanism; and a stop member defining lever mounted on a pivot pin carried by a housing of said trigger-mechanism for pivotal movement about an axis perpendicular to the direction of movement of the breechblock carrier between an operative position, in which a free end thereof bears against said breechblock carrier when said breechblock is in said first position, and an inoperative position in which said free end lies out of the path of movement of said carrier,

a safety device for said trigger mechanism comprising a spring assembly pivotally connected at one end of said lever and at the opposite end to a fixed point on said shot gun, such that pivoting a said lever between said operative position and said inoperative position causes pivoting of said spring assembly between a first position and a second position respectively, said spring assembly defining a straight line of action which in said second position lies on one side of a straight line joining said fixed point to a point on said axis of the lever so that the spring assembly biases the lever towards said inoperative position, and said straight line of action of the spring assembly coinciding

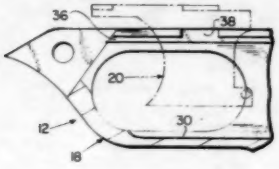
with said straight line joining said fixed point to said point on said axis in the maximum loading condition of said spring assembly.

4,392,320

TRIGGER RETAINING AND STABILIZING MEANS

Robert L. Hillberg, 26 Mount Sanford Rd., Cheshire, Conn. 06410, and Frederick F. Stevens, 177 Brett Rd., Fairfield, Conn. 06430

Filed Apr. 29, 1982, Ser. No. 373,263
Int. Cl.³ F41C *17/00*
U.S. Cl. 42—69 R **11 Claims**



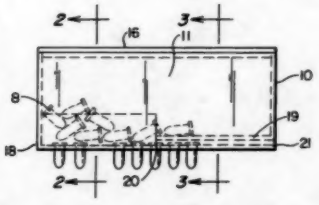
1. In a gun having a frame and a trigger supported in assembly in a guideway defined by the frame for reciprocal movement longitudinally of the frame between ready and firing positions the improvement comprising said frame having a longitudinally extending guide track communicating with said guideway and at least one opening communicating with said guideway and said guide track, said trigger having longitudinally spaced apart guide elements slidably received within said guide track and retaining said trigger in assembly with said frame within said guideway, said trigger having an assembly position relative to said frame wherein one of said guide elements is aligned with said one opening for movement through said one opening and said trigger is free to move into and out of assembled relation with said frame.

4,392,321

RIMMED CARTRIDGE MAGAZINE LOADER

Jack L. Bosworth, 5674 Kingship Loop, Columbus, Ohio 43229

Filed Sep. 30, 1980, Ser. No. 192,461
Int. Cl.³ F42B *39/06*
U.S. Cl. 42—87 **6 Claims**



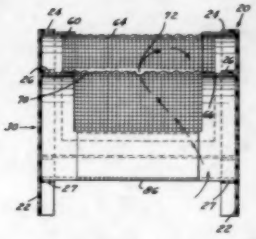
1. A rimmed cartridge magazine loader comprising:
parallel elongated members forming a slot for slidably retaining cartridges by the rims thereof in the slot formed by said parallel members,
a portion of said slot formed by said members communicating with a bulk cartridge reservoir which contains means for directing the cartridges into said slot whereby the body of the cartridge can pass from the reservoir through the slot and the rim of the cartridge is retained by said elongated members,
a portion of said slot being closed on the back by means capable of slidably retaining the cartridges in the slot,
said slot having an opening at the end of the closed portion of the slot suitable for discharge of the cartridges into a magazine.

4,392,322

DISPOSABLE FLY TRAP

Robert J. Kaveloski, 39663 Balboa, Sterling Heights, Mich. 48078

Filed Aug. 6, 1981, Ser. No. 290,483
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—118 **7 Claims**



1. In a fly trap of the type utilizing spaced outer and an inner arch-shaped walls each having an outer light transmitting opening closed by a translucent sheet of material, and a base and fly inlet opening adjacent the base, that improvement which comprises:
(a) a pair of independent end plates each provided with spaced outer and an inner confining means extending inwardly from said plates, and
(b) a disposable central bridging unit of flexible material between said walls formed of a closed loop shaped to provide an outer arch confined by said outer confining means, and to provide an inner arch below and spaced from the outer arch and confined by said inner confining means, a portion of said loop below said inner arch being folded down in a direction opposite to the inner arch to provide a bottom for said trap with ends open to admit flies to the inner arch.

4,392,323

TOY WITH TURNABLE ELEMENTS FOR FORMING GEOMETRIC SHAPES

Ernö Rubik, Budapest, Hungary, assignor to Politoys Ipari Szövetkezet, Budapest, Hungary

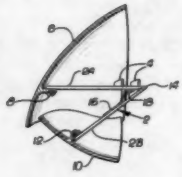
Filed Jul. 24, 1981, Ser. No. 286,458
Claims priority, application Hungary, Nov. 18, 1980, 2752/80
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—1 R **4 Claims**

1. A toy for constructing different geometric shapes comprising: a plurality of identical toy elements each comprising an isoceles right triangular prism having two square side faces and a quadratic hypotenuse face; means connecting the elements in a row with side faces of each intermediate identical element abutting side faces of other identical elements for rotation of each element about the axis normal to each abutting side face

and relative to the remaining elements; and means for positively maintaining each element in any one of four equally

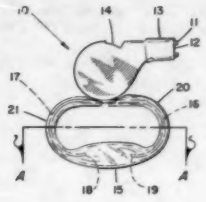
spaced discrete angular orientations relative to the adjacent elements.

4,392,324
MOUTH OPERABLE MASK DEVICE
Jeff Harris, Los Angeles; Charles A. Chambers, Burbank, and Jack M. Horwitz, Los Angeles, all of Calif., assignors to Minkey Farms Partnership, Los Angeles, Calif., a part interest
Filed Aug. 5, 1981, Ser. No. 290,389
Int. Cl.³ A63H *33/00*; A42B *1/18*
U.S. Cl. 46—1 F **1 Claim**



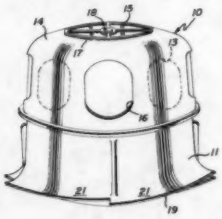
1. A mouth operable mask comprising:
a flexible V-shaped element capable of being inserted into the wearer's mouth;
at least one brace, attached to one of the legs of said V-shaped element, which may be gripped by the wearer's teeth;
an upper mask portion attached to one of the legs of said V-shaped element and a lower mask portion attached to the other of the legs of said V-shaped element, whereby flexing of said V-shaped element produces relative motion between said upper and lower mask portions;
wherein said V-shaped element includes a flexible hinge composed of resilient plastic whereby the resiliency of said hinge biases said V-shaped element in an open position; and
a metal element attached to the interior side of one of said legs of said V-shaped element and being in contact with the interior side of said other of said legs, wherein said metal element generates a clicking noise when said V-shaped element is flexed.

4,392,325
SPORTS WHISTLE WITH FINGER GRIP
Eli M. Woronets, 14413 Mansa Dr., La Mirada, Calif. 90638
Filed Sep. 17, 1981, Ser. No. 302,982
Int. Cl.³ A63H *5/00*
U.S. Cl. 46—179 **7 Claims**



1. An improved, mouth-blown whistle, comprising:
(a) a hollow body having an air inlet and an air outlet;
(b) cushioning means disposed peripherially about the outside of said air inlet to prevent chipping of the user's teeth as the air inlet end of the whistle is inserted into the user's mouth to blow said whistle and even while the whistle is being blown;
(c) a C-shaped finger gripping member secured to the underside of said body; and
(d) resilient covering means over said finger gripping member and bridging the opening between the open ends of said C-shaped member, said portion of said resilient covering means bridging the space bulbously enlarged to fill the empty space between the two fingers which engage the finger gripping member thereby creating a frictional gripping action between said resilient covering means and the two fingers inserted therein to hold the whistle.

4,392,326
PLANT SHELTER
Thomas J. Boria, 34 Howe St., Millbury, Mass. 01527
Filed Jun. 25, 1981, Ser. No. 277,102
Int. Cl.³ A01G *13/00*
U.S. Cl. 47—28 R **13 Claims**



1. Plant shelter, comprising:
(a) a dome-like lower shell having a generally vertical transparent wall with primary apertures which are sufficiently large to allow passage of bees, and
(b) an upper shell conforming generally to the upper portion of the lower shell and having a generally vertical transparent wall which overlaps at least the upper half of the vertical wall of the lower shell and has primary apertures which are sufficiently large to allow passage of bees, the upper and lower shells being held together for relative sliding movement from a first position at which the apertures of the upper shell are coextensive with the apertures of the lower shell to allow air and bee movement in and out of the shelter to a second position at which the apertures of the upper shell are non-coextensive with the

apertures of the lower shell, the upper shell being provided with a rain-collecting ridge in its upper portion in the form of a closed figure, said upper shell having secondary apertures lying within the figure, and the lower shell having similar secondary apertures for cooperation with the secondary apertures in the upper shell to drain rain water from within the ridge to the interior of the lower shell.

4,392,327

PLANT GROWING UNIT, METHOD AND SYSTEM

Bernard Sanders, Jersey, Channel Islands, assignor to Bonar Horticulture, Ltd., Dundee, Scotland

Filed Jun. 19, 1981, Ser. No. 275,194

Claims priority, application United Kingdom, Jun. 20, 1980, 8020224

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—59 **14 Claims**

1. A method for growing plants utilizing a plant growing system constructed from a sheet of flexible plastic material folded to provide opposite walls and said opposite walls being secured along a longitudinal division to form elongated upper and lower compartments, said upper compartment having an elongated top portion and constituting a multiple plant root-ball container open along said top portion for upward growth of multiple plants in said container, and said lower compartment constituting a reservoir for water, said lower compartment having level restricting means for establishing a maximum level of water in the reservoir, and means including a water carrier of flexible capillary material secured along said longitudinal division and leaving openings from said container to said reservoir in said lower compartment, said water carrier extending between said upper and lower compartments, said method comprising the steps of:

placing multiple plants in a row in said upper compartment providing said container of said system;

supporting said sheet of flexible plastic material by an elongated member extending along the elongated top portion of said upper compartment so that said upper and lower compartments hang below said supported portion;

introducing water into said container onto plants therein and draining the water through said openings into said lower compartment providing a reservoir;

establishing a maximum level of water in said reservoir by said level restricting means and producing an air space between said water level and the root-balls of said plants in said container bridged by said water carrier;

venting said air space;

supplying air and water to the root-balls of said plants in said container from said vented air space and said reservoir in said lower compartment through said openings and said water carrier for growing the plants; and

replenishing the water in said lower compartment by introducing water into said container onto plants therein and draining water from said container through said openings to maintain a reservoir of water and a vented air space above the water level for supply of air and water to the root-balls of said plants in said container.

4,392,328

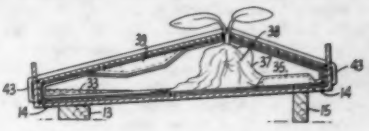
CELLULAR MOIST FILM PLANT CULTURE SYSTEM

Fred L. Walker, 55 San Marcos Ct., Salinas, Calif. 93901

Filed Jul. 6, 1981, Ser. No. 280,358

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—62 **8 Claims**



1. A moist film plant culture system for growing plants comprising:

impermeable envelope having top and side wall means confining an air space in which roots of plants can grow, said envelope means having a seam along at least one edge thereof,

support means for supporting the root ball of a plant within said air space,

a first water absorbent matting material of high capillarity fastened within the envelope and a second water absorbent matting material of high capillarity surrounding the root ball, the surrounded root ball and expanding root system and the growing plant structure being supported on said first matting material within said air space,

said envelope being two ply with one ply including a flexible moisture impermeable outer sheet and a second ply including said first matting material, said envelope further including a plurality of stiff cross ribs to maintain the walls and top means of the envelope in an elevated position to maintain said interior air space when the seam is closed, said flexible envelope being collapsible for shipping the culture system,

a dry chemical nutrient packet, said packet being formed by a third water absorbent matting material enclosing a dry chemical nutrient, said nutrient pack being in contact with said first water absorbent material and spaced from the root ball, a nutrient transfer means for transferring nutrient from said packet to said plant structure, said transfer means including said matting materials, whereby when said water absorbent materials are wet, dissolved chemicals are leached from said nutrient packet and will migrate from the chemical packet to the root ball and to all root bearing surfaces,

means for closing the seam of said envelope around the individual stems of a plurality of plants whereby the root balls and growing roots of said plants are surrounded by a confined pocket of highly humid air within said envelope and in contact with said water absorbent material and the leaves and stems of said plant protrude beyond said seams, and,

a water reservoir spaced from said root ball and from said chemical packet and located to maintain water in contact with said first matting material and out of free water contact with the dry chemical packet.

4,392,329

PIVOTABLE WINDOW MOVED BETWEEN LOCKED AND OPENED POSITIONS BY MEANS OF A SINGLE OPERATING HANDLE

Jyuji Suzuki, Sayama, Japan, assignor to Nippon Elumin Sash Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1980, Ser. No. 215,551

Int. Cl.³ E05F *9/00*

U.S. Cl. 49—356 **15 Claims**

1. A window comprising:

a window frame including upper, lower, left, and right frame members, and defining a plurality of corners and an inner,

peripheral groove extending around the interior of the frame;

a window screen;

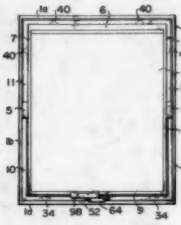
means connecting the window screen to the window frame for pivotal movement therewithin between open and closed positions;

a movable endless belt extending around the interior of the window frame and including

upper, lower, left, and right sliding members supported by the window frame for reciprocating movement within the inner peripheral groove of the frame,

a plurality of rollers connecting ends of adjacent sliding members to translate reciprocating movement thereof around the corners of the frame, and

means supported by the frame for guiding movement of the rollers around the corners of the frame;



locking means including

first means secured to the window screen,

second means supported by the window frame for movement between a locking position, to engage the first means and securely hold the window screen in the closed position, and an unlocking position, disengaged from the first means, and

link means connecting the second means with the endless belt to move the second means between the locking and unlocking positions; and

an operating mechanism connected to the endless belt to move the endless belt and the second means between the said locking and unlocking positions, and also connected to the window screen to move the window screen between its open and closed positions.

4,392,330

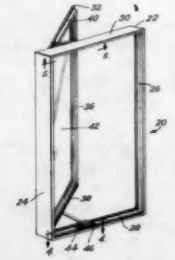
CASEMENT WINDOW

Terry J. Buhr, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed Jun. 2, 1981, Ser. No. 269,628

Int. Cl.³ E05D *15/00*

U.S. Cl. 49—381 **5 Claims**



1. A casement window operable in a vent-egress mode and a wash mode comprising:

a window frame;

a window sash movably mounted on said frame;

a sash hinge plate mounted on said sash;

a hinge shoe with a channel-travelling flange member;

hinge means for providing pivotal movement of said sash relative to said hinge shoe, said hinge means being connected to said sashhinge plate and hinge shoe; and

mode-shifting means for shifting of the sash to and from the vent-egress and wash modes, the mode-shifting means including a channel-forming slide member secured to the window frame, the channel-travelling flange of the hinge shoe being slidably secured to the slide member, and means for releasably locking the hinge shoe to the slide member in two positions of the hinge shoe relative to the slide member, one of the two positions being a vent-egress position in which the sash is in the vent-egress mode and the other of the two positions being a wash position in which the sash is in the wash mode.

4,392,331

CLAMPABLE APPARATUS FOR GRINDING SPHERICAL SURFACES

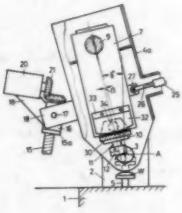
Günter Schimitzek, An der Reute, 7923 Konigsbroan, and Horst Reiche, Uhlandstr. 36, 7923 Konigsbroan, Zang, both of Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,585

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2937977

Int. Cl.³ B24B *13/00*

U.S. Cl. 51—55 **17 Claims**



1. Clampable apparatus operable at a heated operating temperature for producing convex and/or concave spherical surfaces in workpieces such as optical lenses, comprising

a frame,

a swivel arm substantially in the form of a gantry and mounted on the frame such that its angle of inclination relative thereto is adjustable, the swivel arm including two support portions having an axle extending therebetween,

a rocker arm pivotally and adjustably mounted on the axle,

the swivel arm and rocker arm being adjustably locatable and securable in a selective adjustment position,

a spindle sleeve housing axially displaceably mounted on the rocker arm and having a tool spindle for carrying a machine tool and being received in the housing and mounted for rotation about a tool spindle axis of rotation lying in a tool spindle plane, which plane is normal to the axle, in any adjustment position of the swivel arm and rocker arm,

a workpiece spindle for supporting a workpiece to be machined by the machine tool and being arranged at the frame such that the machine tool and workpiece are locatable in the plane of the axis of rotation of the tool spindle, and

a pair of clamping devices for retaining the swivel arm and rocker arm in any such adjustment position,

said clamping devices being substantially identical and symmetrically disposed relative to the axis of rotation of the tool spindle so as to be substantially mirror images of one another, each clamping device having two cooperating members which are clampingly embraceable by frictional

engagement with one another, one such member being mounted on the swivel arm and the other such member being mounted on the rocker arm, one of the members of each clamping device being arranged for operative displacement to a heated operating temperature displacement location relative to the arm on which it is mounted, when the apparatus is at its corresponding heated operating temperature, for operative engagement at such displacement location with the other member of such clamping device, whereby to prevent lateral deviation of the rocker arm and in turn of the tool spindle axis of rotation from the tool spindle plane.

4,392,332

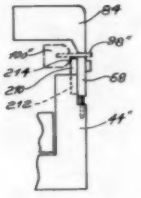
ICE SKATE SHARPENER

Glenn Sakeriska, Ypsilanti, Mich., assignor to Canadian Skate Contours, Ltd., Mississauga, Canada

Continuation of Ser. No. 70,408, Aug. 27, 1979, Pat. No. 4,294,043, which is a division of Ser. No. 869,696, Jan. 16, 1978, Pat. No. 4,172,343, which is a continuation-in-part of Ser. No. 745,362, Nov. 26, 1976, Pat. No. 4,069,620. This application Jun. 22, 1981, Ser. No. 275,794

Int. Cl.³ B24B *9/04*

U.S. Cl. 51—92 BS **3 Claims**



1. In an ice skate sharpening fixture having opposed jaws for retaining an ice skate therein, and follower means on said fixture, the ice skate having longitudinally curved blade clamp lips engaging the ice skate blade and an equivalent center location on the blade, and the fixture having a fixed centerline relative to the fixture follower means,

the improvement comprising separate blade clamp lip locating means adjacent at least one jaw and equidistant from the fixture centerline, each of said separate blade clamp lip locating means not extending in a direction parallel to jaw clamping movement beyond the clamping surface of the jaw thereadjacent upon clamping an ice skate in said fixture, and said separate blade clamp lip locating means positioned to engage at least one of the blade clamp lips equidistant from the equivalent center location on the blade and adjacent the exposed portion of the blade.

4,392,333

GUIDE WHEELS FOR BELT GRINDER

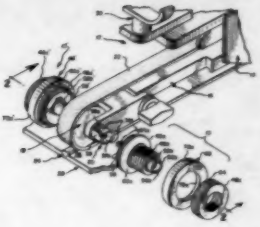
Walter N. Welsch, Tonawanda, N.Y., assignor to Dynabrade, Inc., Tonawanda, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,096

Int. Cl.³ B24B *23/06*

U.S. Cl. 51—170 EB **5 Claims**

1. Guide means for an abrading device of the type having an endless abrasive belt trained over a contact wheel supported for rotation about an axis, said guide means including wheel means for guiding said contact wheel relative to the surface of a workpiece engaged by said belt while passing over said contact wheel, said wheel means defining an annularly extending groove disposed concentrically of said axis and bounded by radially outwardly divergent surfaces, said groove being characterized as having a maximum diameter and a minimum diameter, said wheel means being adjustable to selectively vary the width of said groove in a direction aligned with said axis; and a tire received within said groove, said tire being formed of a relatively rigid material and having an outer surface for engaging said workpiece, a concentrically arranged through opening and opposite side surface portions extending between said outer surface and said through opening and arranged for engagement with said surfaces of said groove, said outer surface having a diameter exceeding said maximum diameter, said



through opening having a diameter less than said maximum diameter, while exceeding said minimum diameter by an amount permitting displacement of said tire transversely of said axis incident to engagement of said outer surface with said workpiece, characterized in that said width of said groove determines the extent of said displacements of said tire.

4,392,334

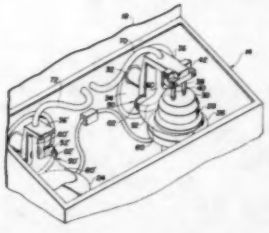
FLUID DISPERSING APPARATUS FOR USE IN PRODUCING OPHTHALMIC LENSES

Joseph Tusinski, and Phillip D. Hill, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Nov. 19, 1980, Ser. No. 208,376

Int. Cl.³ B24B *57/00, 55/02*

U.S. Cl. 51—263 **5 Claims**



1. A fluid dispersing apparatus operable for use in ophthalmic lens producing machines and the like, said fluid dispersing apparatus comprising:

a dispersing member having,

a landing surface operable to be positioned at

an angle with respect to a free flowing column of fluid, and

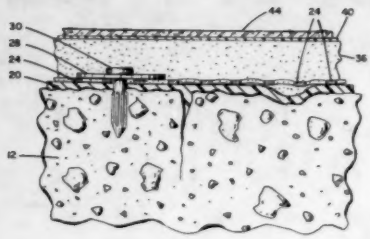
an extension strip extending away from said landing surfce in an intended direction of flow of the fluid at an obtuse angle with respect to said landing surface, said extension strip being fashioned with an arcuate front edge portion when viewed in a plan perspective, and being curved away from the intended direction of travel of the sheet of fluid away from said landing surface extension strip; and

means connected to said dispersing member for operably mounting said dispersing member upon a machine adjacent to a source of generally columnar flowing fluid.

4,392,335
FLEXIBLE CEMENTITIOUS COATINGS

Robert B. Heiman, Los Angeles, Calif., assignor to Astro-Steel Grip International, Inc., San Francisco, Calif.

Filed Apr. 12, 1982, Ser. No. 368,211
Int. Cl.³ E01C 15/00; B05D 3/00; B32B 13/04
U.S. Cl. 52—309.17 19 Claims



1. A flexible cementitious overlayer for installation over the unsealed surface of a base material comprising, in combination:
a hardened underlayer of adhesive of a kind to which a combination of Portland cement and polymeric resin will adhere and which has the quality of penetrating and bonding to unsealed base material surfaces;
a layer of hardened cementitious material comprising a mixture of polymeric resins and hydrolyzed Portland cement overlying and bonded to said underlayer of adhesive; and
an overlayer of epoxy adhesive paint overlying said layer of hardened cementitious material.

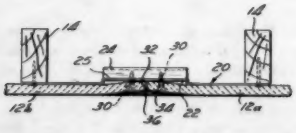
2. The invention defined in claim 1 which further comprises a layer of metal screening embedded in said layer of hardened cementitious material.

3. The invention defined in claim 2 which further comprises fastening means in the form of mechanical fasteners extending through said metal screening and through said adhesive underlayer for mechanically fastening said metal screening to a base material.

4,392,336
DRYWALL CONSTRUCTION AND ARTICLE OF MANUFACTURE THEREFOR

Jack L. Ganssle, 29567 Fountainwood, Agoura Hills, Calif. 91301

Filed Mar. 13, 1981, Ser. No. 243,611
Int. Cl.³ E04B 2/00
U.S. Cl. 52—417 1 Claim

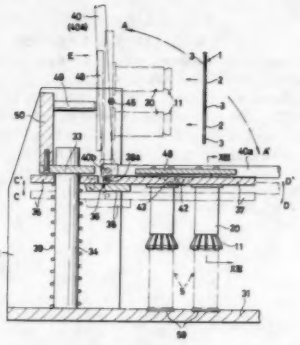


1. An article of manufacture, for use in molding wallboard panels between studs, which comprises: an elongated substantially rigid unitary strap member having elongated end portions which are substantially co-planar with respect to each other, an elongated recessed portion centrally located between said end portions, said elongated co-planar end portions extending inwardly of said studs for a substantial distance and said elongated recessed portion therebetween extending for a distance of about 5–9 inches in length, and substantially less than the distance between studs, predrilled openings defined within the ends of each of said elongated co-planar end portions, and a stiffener means affixed to said elongated recessed portion to resist pulling forces on said strap member.

4,392,337
APPARATUS FOR ATTACHMENT OF CARRIER SHEET TO CONTAINERS

Kunio Hara, Kawasaki, Japan, assignor to Nifco, Inc., Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,926
Claims priority, application Japan, Dec. 18, 1978, 53-154881
Int. Cl.³ B65B 27/04
U.S. Cl. 53—48 2 Claims



1. An apparatus for the attachment of a carrier sheet to containers wherein the carrier sheet containing openings of a diameter smaller than the diameter at the peripheral edges of the containers and permitting insertion therethrough of the containers is attached below the peripheral edges of the containers by causing the circumferential portions surrounding the openings in the carrier sheet to be forcibly expanded outwardly to be passed over the peripheral edges, which apparatus comprises: vertical funnel members for carrying said carrier sheet each having an upper portion of a diameter smaller than the diameter of the openings in the carrier sheet and a funnel-shaped portion having an intermediate portion of a diameter substantially equal to the diameter of the openings and a lower large diameter leading end portion engageable with the peripheral edge of the container positioned below the funnel, each of the funnel members containing slits cut in the axial direction upwardly from the lower end of the large diameter portion thereof to permit the large diameter portion to be contracted in the radial directions; sleeve members each having an upper end and a lower edge and containing an inner space large enough to embrace therein the funnel member wholly and slits cut in the axial direction in the wall defining the inner space upwardly from said edge thereof to divide the wall and enable said edge of the opening to be expanded in the radial directions over said funnel leading end portion thereby pushing said carrier sheet over the containers, the edge of the opening in a normal condition having a diameter smaller than the largest diameter of the large diameter portion of the funnel member and contracting members each disposed concenrtrically between the funnel member and the sleeve member, slidably mounted relative to both the aforementioned members, so that the leading end thereof is moved into contact with the funnel-shaped portion of the funnel member and, through the medium of the funnel-shaped portion, contract the leading end of the funnel member to a diameter smaller than the diameter of the opening in the carrier sheet to permit mounting of said carrier sheet on the funnel; a bottom plate member which stabilizes the apparatus and supports the containers to be packaged, said sleeve members being fastened at their upper ends to a sleeve support member positioned above the bottom plate member, the funnel members pass through said sleeve support

member at an end portion opposite said leading end thereof and penetrate the sleeve members to the portions thereof having a diameter substantially equal to the diameter of the openings in the carrier sheet, the funnel members and the sleeve members are interposed to stop means each adapted to enable the funnel member to be slid in the axial direction only upwardly from the position which the funnel member has reached in the penetration of the sleeve member, the contracting members pass through the sleeve support member and are fastened to an actuating member disposed at a prescribed distance from the sleeve support member, and the actuating member is supported in a manner slideable in the direction of the sleeve support member; the actuating member to which the contracting members are fastened being separated by the prescribed distance from the sleeve support means through the medium of intervening spring means; a member for holding the sleeve support member at a height such that the sleeves supported by the sleeve support member face downwardly toward the bottom plate member and the leading ends of the funnel members engage with the peripheral edges of containers, hinge means allowing the sleeve support member to rotate upwardly away from the bottom plate member and relative to the holding member, a stop member to prevent the sleeve support member from rotating in the downward direction, energizing means for supporting the holding member at its original position corresponding to the aforementioned height at which the sleeve support member is supported and, after the holding member has been vertically lowered, relative to the bottom plate member, from the original position in conjunction with the sleeve support member, imparting to the holding member an energizing force capable of returning the holding member to the original position, means actuated, upon an upward rotation of the sleeve support member, to come into engagement with the actuating member having the contracting member fastened thereto and press the actuating member against the sleeve support member.

4,392,338

PACKETS AND THE MANUFACTURE THEREOF

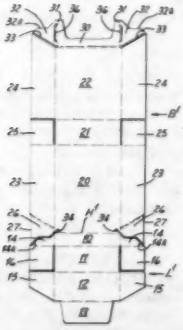
Austin L. Fox, London, England, assignor to Molins Limited, London, England

Continuation of Ser. No. 956,159, Oct. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 775,023, Oct. 7, 1977, abandoned. This application Nov. 24, 1980, Ser. No. 209,614

Claims priority, application United Kingdom, Mar. 15, 1976, 10324/76; Nov. 8, 1977, 46491/77

Int. Cl.[3] **B65B** *11/48;* **B65D** *5/66, 85/10*

U.S. Cl. 53—462 **4 Claims**



1. A method of erecting a one-piece blank made of a single layer of material of substantially rectangular configuration cut and scored for folding about contents to form a hinged lid packet having a lid portion hinged to a body portion;

(a) wherein said blank comprises:

1. a central portion extending from the top to the bottom of said blank and divided by at least six parallel spaced-apart transverse foldable scored lines into, consecutively from the top to the bottom of said blank, a panel, a front wall, a bottom wall and a rear wall for forming said body portion and a rear wall, a top wall and a front wall for forming said lid portion, the combined length of said panel and front wall of said body portion being substantially the same as the combined length of said rear walls of said body and lid portions; and

2. an outer portion at each of the left and right sides of said central portion, each outer portion comprising a side flap foldably attached to said panel, an outer flap foldably attached to said front wall of said body portion, said side flap having a top edge facing away from said outer flap, an inner flap foldably attached to said rear wall of said body portion, the length of said inner flap of said body portion being greater than the length of said outer flap of said body portion, an inner flap foldably attached to said rear wall of said lid portion and an outer flap foldably attached to said front wall of said lid portion, the bottom edge of said inner flap of said lid portion being coextensive with a straight line coextensive with the foldable scored line between said top wall and rear wall of said lid portion, and the top edge of said inner flap of said lid portion being spaced from said bottom edge thereof, the length of said outer flap of said lid portion being greater than the length of said inner flap of said lid portion;

3. the relative dimensions of said inner flap of said lid portion and said side flap of said body portion of each of said outer portions being such that the distance of said top edge of said inner flap of said lid portion from a straight line coextensive with the foldable scored line between said rear wall and bottom wall of said body portion, said distance being measured parallel to the fold line between said inner flap and said rear wall of said body portion, is at least as great as the distance of said top edge of said side flap of said body portion from a straight line coextensive with the foldable scored line between said front wall and bottom wall of said body portion, said distance being measured parallel to the fold line between said outer flap and said front wall of said body portion, at corresponding locations along the entire lengths of said top edge of said inner flap of said lid portion and said top edge of said side flap of said body portion;

(b) said method comprising the following steps in the recited order:

1. forming said rear wall, bottom wall, front wall, panel and inner flaps of said body portion and said rear wall, top wall, front wall and inner flaps of said lid portion about said contents;

2. folding each of said side flaps of said body portion and securing said side flaps of said body portion to the respective inner flaps of said body portion with said lid portion in closed position;

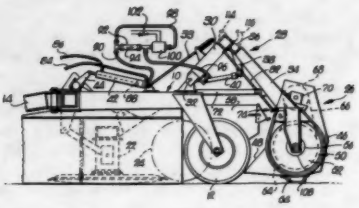
3. then folding each of said outer flaps of said body and lid portions and securing said outer flaps of said body and lid portions to the respective inner flaps of said body and lid portions with said lid portion maintained in closed position, whereby said top edge of each said side flap of said body portion and the respective top edge of said inner flap of said lid portion confront each other along their entire lengths, and said side flap of said body portion does not overlap said inner flap of said lid portion, said relative dimensions of said respective inner flaps of said lid portion and said side flaps of said body portion assuring that said side flaps of said body portion do not intervene between and are not secured to said inner and outer flaps of said lid portion during said folding and said securing of the respective body and lid portions.

4,392,339

CROP WINDROWING MACHINE HAVING DOUBLE WINDROW-FORMING ATTACHMENT

Marc A. Berlivet, and Abel A. J. Guerineau, both of Coex, France, assignors to Hesston Corporation, Hesston, Kans.

Filed Nov. 25, 1981, Ser. No. 324,814
Claims priority, application France, Nov. 26, 1980, 80 25099
Int. Cl.³ A01D 57/30
U.S. Cl. 56—192 5 Claims



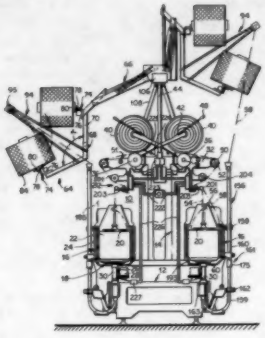
1. A machine for harvesting crops comprising:
a mobile frame;
crop severing means carried by said frame at the normally forward extremity of the latter;
means for coupling said frame to a vehicle in such manner that the crop severing means is located in laterally offset relationship to the path of travel of the vehicle;
means for converging the severed crop centrally of the cut taken by the severing means and for discharging the converged crop rearwardly into a centrally disposed windrow behind the frame; and
selectively operable double windrow forming mechanism carried by the frame,
said mechanism including a transverse conveyor and means for selectively positioning said conveyor in a location behind the severing means to intercept the centrally converged and rearwardly discharged crop before the latter forms a windrow on the ground,
said conveyor having a discharge end disposed for discharging crop laterally outboard of the cut taken by said severing means and into the path of travel of said vehicle behind the latter when said conveyor is in its said crop intercepting location whereby to permit formation of a second windrow adjacently alongside of a first windrow prepared during the next preceding pass of the machine with said conveyor positioned out of its said crop intercepting location,
said severing means being mounted on said frame for movement between a raised, transport position and a lowered, working position,
said severing means being provided with a fluid pressure operated power unit for effecting said raising and lowering of the severing means,
said power device for the conveyor being fluid pressure operated and being coupled in parallel fluid flow relationship with said power unit of the severing means,
said power device further being responsive to a lower pressure force than said power unit whereby to permit raising of the conveyor out of said crop intercepting location thereof without raising said severing means when the power unit and the power device are both pressurized.

4,392,340

YARN MONITOR FOR TWO-YARN CABLING OR TWISTING MACHINE

Aloys Horstmann, Greven; Heinz Eckholt, Münster, and Reinhard Veltel, Everswinkel, all of Fed. Rep. of Germany, assignors to Volkmann GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,024
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939435
Int. Cl.³ D01H 1/24, 13/16
U.S. Cl. 57—83 8 Claims



1. A method of operating a textile machine comprising the steps of:
feeding two primary yarns under relatively low longitudinal tension from respective yarn supplies to a combining location;
combining said primary yarns at said location;
feeding the combined yarns from said location under relatively high longitudinal tension to a takeup station;
continuously monitoring the tension in said combined yarns between said location and said takeup station;
generating an output when the tension in said combined yarns drops from said high tension below a predetermined level at least equal to said relatively low tension as a result of breakage of one of said primary yarns;
interrupting the feeds of said yarns when said output is generated, said yarns being fed and longitudinally tensioned by being wound up on a takeup element at said takeup station, said yarns being combined by being wound together; and
spinning one of said primary yarns about the respective supply as a balloon upstream of said location, said tension being monitored by:
passing said combined yarns over a roller forming a deflecting element between said location and station,
urging said deflecting element in a direction increasing the length of the path of said combined yarns between said location and said station, and
detecting the position of said element to determine the tension in said combined yarns by the release of a member acting upon said element.

4,392,341

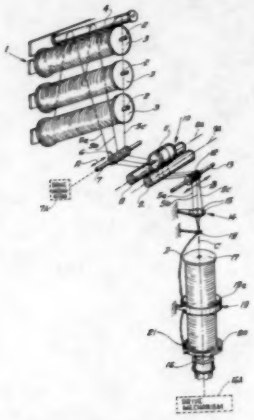
TWISTING MACHINE

Werner Grill, Kempten, Fed. Rep. of Germany, assignor to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,413
Claims priority, application Fed. Rep. of Germany, May 21, 1981, 8115081[U]
Int. Cl.³ D01H 1/02, 13/04
U.S. Cl. 57—90 7 Claims

1. In a machine for twisting several filament yarn strands wrapped on spools, including a creel for supporting the spools,

a delivery system which includes several feed rollers, a first thread guide supported along the thread path between the spools and the delivery system for movement back and forth in directions parallel to the axes of the feed rollers and having a guideway for each of the yarn strands, thread-guiding means following the delivery system, a rotatable spindle for supporting a winding bobbin, a second thread guide arranged along an extension of the axis of the spindle and having a respective guide eyelet for each yarn strand, and a third thread guide



which follows the second thread guide and has an opening through which all yarn strands are guided together, the improvement comprising wherein the first thread guide is a first guide roller which has a circumferential guide groove for each yarn strand and is freely rotatable about an axis which extends generally parallel to the feed roller axes, and wherein the thread-guiding means includes a second guide roller which is supported for rotational and axial movement with respect to an axis generally parallel to the feed roller axes and which has a circumferential guide groove for each yarn strand.

4,392,342

CABLE STRANDING APPARATUS AND METHOD OF OPERATING IT

Johan F. R. Meijer, Zaandam, Netherlands, assignor to N.K.F. Groep B.V., Rijswijk, Netherlands

Filed May 7, 1981, Ser. No. 261,430

Claims priority, application Netherlands, May 14, 1980, 8002786

Int. Cl.³ D07B *3/06, 7/06*

U.S. Cl. 57—264 **11 Claims**

1. A method of manufacturing a stranded product, comprising:

mounting a plurality of feed reels, each containing material wound thereon, in a feed cage,

rotating the feed cage about an axis,

controlling the speed of the cage rotation,

pulling the material from the feed reels through a stranding device, and

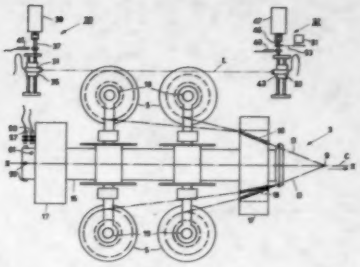
winding the stranded product onto a take-up reel,

characterized in that said rotating and controlling steps comprise:

directing an energy beam past said feed reels such that interruption of the beam by the charge of the material on a feed reel is a function of the size of the charge;

monitoring the charge on a feed reel by sensing the beam energy which passes the reel without interruption; and

controlling the speed of cage rotation responsive to said monitoring such that centrifugal force due to rotation of the cage



and feed reels is maintained approximately constant at a maximum safe value.

4,392,343

FRICTION SPINNING APPARATUS

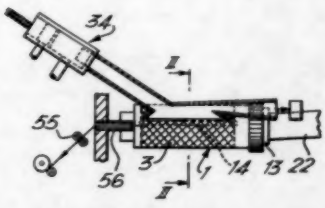
Alan Parker, 7 Darvel Close, Breightmet, Bolton, Lancashire; William M. Farnhill, 335 Colne Rd., Burnley, Lancashire, and Douglas O. Clough, 26 Parkwood Dr., Rawtenstall, Rossendale, Lancashire, all of England

Filed Oct. 6, 1981, Ser. No. 308,955

Claims priority, application United Kingdom, Oct. 8, 1980, 8032417

Int. Cl.³ D01H *7/882*

U.S. Cl. 57—401 **6 Claims**

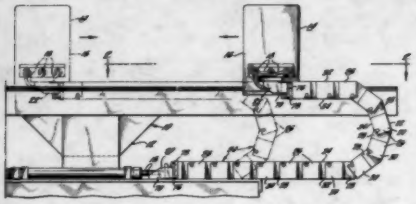


1. Apparatus for open end spinning of yarns comprising two bodies of rotation each defining a surface and arranged such that the surfaces lie closely adjacent at a line of closest approach so as to define between them an elongate throat which narrows toward the line of closest approach, at least one of the surfaces being perforated, means defining a slot adjacent said at least one surface, suction means for drawing air through that portion of the surface delineated by the slot, a feed duct for feeding fibres into the throat, the feed duct terminating within the throat and adjacent the line in an elongate mouth substantially parallel to the line and spaced from the line a distance less than the radius of curvature of each of the bodies and including two surfaces each lying along a respective side of the mouth and arranged closely adjacent to a respective body surface and each being curved in a direction away from the mouth so as to follow the curvature of the adjacent portion of body surface and be separated therefrom by a gap distance of at most 0.5 mm., means for rotating each of the bodies about a respective axis so as to twist the fibres in the area into a yarn, and means for withdrawing the yarn from the area.

4,392,344
CHAIN-LINK CABLE CARRIER

Edmund A. Gordon, deceased, late of Philadelphia, Pa. (by Alvina A. Gordon, and Emma C. Caudde Administratrices), and by John Yaecker, Administrator, North Wales,, Pa., assignors to Central Safety Equipment Company, Burlington, N.J.

Filed Jun. 30, 1981, Ser. No. 279,080
Int. Cl.³ F16G *13/16*
U.S. Cl. 59—78.1 **7 Claims**



1. A chain-link type of cable carrier suitable for holding electrical cables, wires, hoses or the like, comprising:

a plurality of links pivotally connected to each other end-to-end in a series chain;

each of said links being of integral tubular plastic construction, having a substantially rectangular cross-section at least adjacent its opposite ends to form a box having open ends, and comprising pivot means adjacent each of said opposite ends thereof for providing pivotal connection of each link to immediately adjacent links in said chain;

one end of each of said links being narrower than its other wider end and the top and bottom of each link having recesses therein adjacent said other end for receiving between its side walls said narrower end of the adjacent link;

said pivot means of each said link being positioned adjacent but inboard of said opposite end thereof, the pivot axes of said pivot means extending at right angles to said side walls so that when said each link is pivoted about one of its pivot axes in one sense with respect to the immediately adjacent link into which it extends, its pivoting is limited by abutment of the top of said narrower end of each said link against the recessed top of the adjacent link, with the top surfaces of said each link and said adjacent link aligned with each other;

said pivot means comprising stop means for limiting pivoting of said each link with respect to said immediately adjacent link in the opposite sense at a predetermined angular position to define the minumum permitted radius of curvature of said carrier along its longitudinal axis; and

said links when pivoted toward said predetermined angular position producing an opening between the top surfaces of adjacent links.

4,392,345
BYPASS CONTROL SYSTEM

Carl H. Geary, Jr., Greensburg, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Oct. 13, 1981, Ser. No. 310,942
Int. Cl.³ F02G *3/00*; B65D *75/00*; B01J *37/12*
U.S. Cl. 60—39.02 **21 Claims**

1. A bypass control system for protecting a power recovery expander comprising:

a power recovery expander;

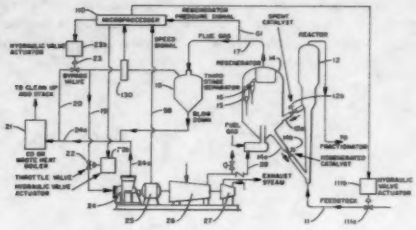
a first fluid path for supplying combustion gas which is subject to containing large amounts of particulates to said expander as a motive fluid;

first valve means for controlling the flow of gas in said first fluid path;

a second fluid path connected to said first fluid path for bypassing said expander;

second valve means for controlling the flow of gas in said second fluid path;

means for determining the particulate concentration in said



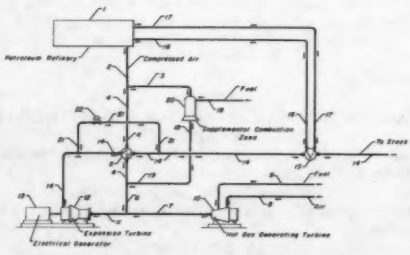
combustion gas in said first fluid path and for generating a signal indicative thereof; and

means for fully opening said second valve means in response to said signal when said signal represents a predetermined particulate level so as to prevent said particulates from passing through said expander.

4,392,346
COGENERATION PROCESS USING AUGMENTED BRAYTON CYCLE

Allen H. Fink, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 171,225, Jul. 22, 1980, Pat. No. 4,338,788. This application Feb. 12, 1981, Ser. No. 234,070
Int. Cl.³ F02C *6/00*
U.S. Cl. 60—39.04 **9 Claims**



1. A power producing cycle which comprised the steps of:

(a) heating a feed air stream having a pressure above 15 psig and a temperature above 65° C. by indirect heat exchange against at least a portion of a hereinafter characterized turbine effluent stream and thereby heating the feed air stream to a temperature above 370° C.;

(b) admixing the feed air stream and a high temperature gas stream and forming a power gas stream;

(c) heating a second air stream in a combustion zone;

(d) admixing said second air stream after heating with said high temperature gas stream prior to passage into a hereinafter characterized turbine;

(e) depressurizing the power gas stream in a turbine and thereby producing the turbine effluent stream; and

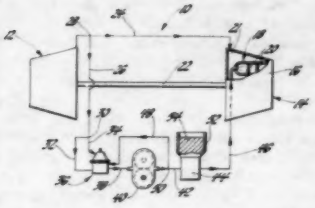
(f) cooling the turbine effluent stream by indirect heat exchange against the feed air stream of step (a).

4,392,347

GAS TURBINE ENGINE FUEL SYSTEM

Everett W. Shows, Lake Orion, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 27, 1981, Ser. No. 287,524
Int. Cl.³ F02C 3/26, 9/20
U.S. Cl. 60—39.27 3 Claims



1. In a gas turbine engine having an operating range between idle and full power and including a combustor, a compressor adapted to supply pressurized air at a variable compressor discharge pressure proportional to engine power to said combustor for fuel combustion within said combustor, a fuel supply apparatus operative to supply a metered quantity of powdered combustible fuel, and nozzle means at said combustor for dispersing a mixture of said powdered fuel and air into said combustor for combustion therein, the improvement comprising, an air pump driven independently of said compressor having an inlet and a discharge wherefrom a stream of air is provided at a pump discharge pressure proportional to pump inlet flow area, means connecting said pump discharge to said nozzle means so that said airstream is dispersed by said nozzle means into said combustor, means connecting said fuel supply apparatus to said pump discharge so that said metered quantity of powdered fuel is entrained in said airstream at said pump discharge pressure and delivered thereby to said nozzle means for dispersal into said combustor, inlet restricting valve means at said pump inlet operative to restrict pump inlet flow area thereby to control said pump discharge pressure, and control means connected to said valve means responsive to said compressor discharge pressure and to said pump discharge pressure to operate said valve means so that said pump discharge pressure varies directly with said compressor discharge pressure and is maintained in excess of said compressor discharge pressure by a constant preselected amount in at least a portion of the operating range of said gas turbine engine.

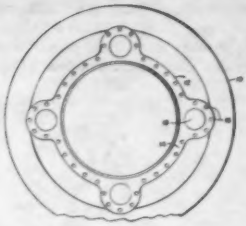
4,392,348

DEVICE FOR BLEEDING MOTOR GASES THRU MOTOR POLE PIECE

Jerry J. Wesson, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1981, Ser. No. 290,138
Int. Cl.³ F02K 9/80
U.S. Cl. 60—229 6 Claims

1. A rocket motor case having a motor flange connected at one end of the rocket case and said flange having a flat surface means with a multiplicity of passages opening from the interior of said rocket motor case through said flat surface means, a rocket nozzle flange having a flat surface and means securing said rocket nozzle flange flat surface to said motor flange flat surface means, said rocket nozzle flange having a plurality of openings therein that extend from said flat surface outwardly to ducts, said openings in said rocket nozzle flange and said



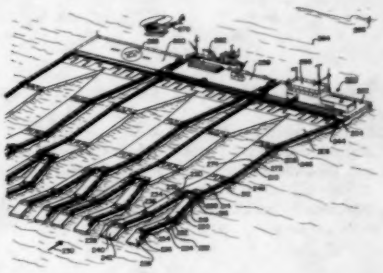
passages in said motor flange being in communication with each other.

4,392,349

SPACED APART WAVE GENERATOR FLOAT ARRAY

Glenn E. Hagen, 13342 Dwyer Blvd., New Orleans, La. 70129

Filed Jul. 21, 1980, Ser. No. 169,509
Int. Cl.³ F03B 13/12
U.S. Cl. 60—500 2 Claims



1. An apparatus floating in a fluid that exhibits wave motion, comprising:

a plurality of adjoining Hagen arrays;

each of said Hagen arrays consisting of a plurality of floating elements, each of said elements being sized to be maximally responsive to a different wave length of said wave motion;

each element of said array being separated from the same sized element of an adjoining array by approximately one-half the specific wave length to which said elements are sized to be maximally responsive.

4,392,350

STIRLING ENGINE POWER CONTROL AND MOTION CONVERSION MECHANISM

David T. Marks, Birmingham, Mich., assignor to Mechanical Technology Incorporation, Latham, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,665
Int. Cl.³ F02G 1/06
U.S. Cl. 60—518 9 Claims

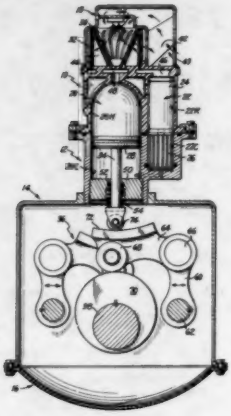
1. A power control/motion conversion device for a Stirling engine having a plurality of pistons for moving a working gas cyclically through a closed working space containing a heater, regenerator and cooler which creates a pressure wave in the gas in the working space, and for moving under the influence of the pressure wave to produce reciprocating output power, the reciprocating output power being converted hereby to rotary output power of a shaft mounted in the engine crankcase on an axis lying perpendicular to the axes of the pistons,

said power control comprising a plurality of control mechanisms, each including:

a power lever having a cam follower on one end and a bearing surface against which the piston operatively bears;

a cam mounted on said shaft in contact with said cam follower;

a pivot at the other end of said power lever for pivotally mounting said lever in said crankcase to swing in a plane



perpendicular to said shaft and containing said piston axis; and

means for moving said pivot in said plane laterally with respect to said shaft to change the lever arm between said can follower and the point at which said piston operatively bears on said lever bearing surface, and thereby change the stroke of said piston and the force of said cam follower on said cam.

4,392,351

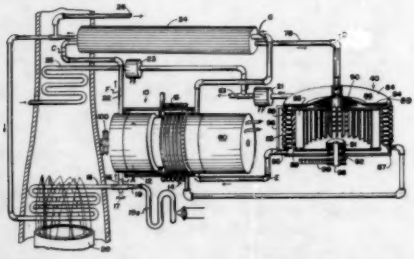
MULTI-CYLINDER STIRLING ENGINE

George J. Doundoulakis, 2498 Kayron La., North Bellmore, N.Y. 11710

Filed Feb. 25, 1980, Ser. No. 124,518

Int. Cl.[3] F02G *1/04*

U.S. Cl. 60—526 6 Claims



1. A multi-cylinder stirling cycle engine comprising:

heater means for heating a working fluid to a working temperature;

a high temperature heat exchanger associated with said heater means for carrying the working fluid past said heater means to bring the working fluid to the working temperature;

rotary expansion chamber means having an input connected to said high temperature heat exchanger for receiving the working fluid at the working temperature and reducing the temperature thereof to produce work;

a bidirectional regenerator connected to an output of said rotary expansion chamber means for carrying the working fluid in a first path and further reducing the temperature thereof;

a low temperature heat exchanger connected to said regenerator for receiving the working fluid and still further reducing the temperature thereof;

rotary compressor chamber means connected to said low temperature heat exchanger for receiving the working fluid from said low temperature heat exchanger and compressing it to a working pressure, said rotary compressor chamber means having an output connected to said regenerator;

said regenerator receiving the working fluid from said compressor means output and carrying it in a second path in counter current flow relationship with said first path to heat the working fluid from said compressor means and cool the working fluid from said rotary expansion chamber means;

said high temperature heat exchanger connected to said regenerator for receiving the heated working fluid;

said rotary expansion chamber means being connected to said rotary compressor chamber means, said rotary expansion chamber means and said rotary compressor chamber means having a common rotating shaft on which the work produced is applied and,

said regenerator comprising an insulating housing, a heat conductive dividing wall extending in said insulating housing dividing said housing into first and second parallel passages, and a plurality of heat conducting fins extending normally from said dividing wall forming said first and said second parallel passages, the working fluid moving in said first passage in said first path and in said second passage in said second path.

4,392,352

APPARATUS FOR REGULATING TURBOCHARGERS AND INTERNAL COMBUSTION ENGINES ASSOCIATED THEREWITH

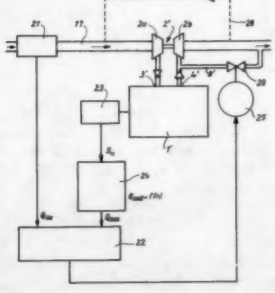
Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 40,795, May 21, 1979, abandoned. This application Jun. 24, 1981, Ser. No. 276,758

Claims priority, application Fed. Rep. of Germany, May 27, 1978, 2823255

Int. Cl.[3] F02B *37/12*

U.S. Cl. 60—602 2 Claims



1. A regulator and anti-overload apparatus for turbochargers for use with an internal combustion engine comprising an air intake manifold, an exhaust tube, an exhaust turbocharger, said turbocharger including a turbine wheel and a compressor

element, said turbine wheel being disposed in said exhaust tube of said engine and said compressor element of said turbocharger being disposed in said intake manifold for delivering combustion air to the engine at increased pressure, an exhaust bypass line that bypasses said turbocharger; said anti-overload apparatus further including an exhaust gas flow control means which in accordance with turbocharger-engine parameters controls flow of partial quantities of exhaust gas through said exhaust bypass line, an air flow rate meter which produces an output value dependent on the flow of air through the air intake manifold, an rpm meter which produces an output value dependent on the rpm of said internal combustion engine, a curve generator to which said output value of said rpm meter is delivered, said curve generator generating a set-point air quantity (Q_{soll}) which corresponds to the particular engine rpm at that time, an electronic regulator having an input which input is connected to the output of said curve generator which delivers said generated set-point air quantity thereto and to the output of said air flow rate meter producing a control signal corresponding to a deviation of the output value of said air flow rate meter from said set-point, said electronic regulator producing an output which is connected to said exhaust gas flow control means for controlling partial quantities of exhaust gas through said exhaust bypass line.

4,392,353

METHOD OF RECOVERING EXHAUST GAS FROM BOILER IN ELECTRICAL POWER GENERATING DEVICE USING COMBUSTIBLE MATERIAL AS FUEL AND APPARATUS FOR PERFORMING SUCH METHOD

Kyoichi Shibuya, Matsudo, and Tomomi Ihara, Narashino, both of Japan, assignors to Sumitomo Semento Kabushiki Kaisha, Japan

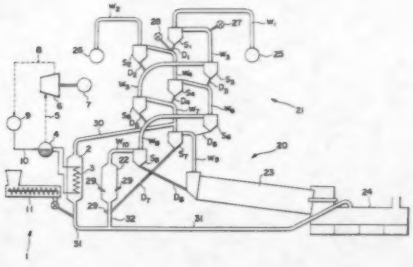
PCT No. PCT/JP81/00028, § 371 Date Oct. 15, 1981, § 102(e) Date Sep. 30, 1981, PCT Pub. No. WO81/02257, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 13, 1981, Ser. No. 308,531

Claims priority, application Japan, Feb. 15, 1980, 55-016535

Int. Cl.³ F01K *15/00*; F27B *15/00*

U.S. Cl. 60—657 **8 Claims**



1. Apparatus for recovering exhaust gas which comprises a powder raw material sintering device and a thermal electric power generating device, said sintering device comprising a preheat section, a calcining section and a cooling section, said electric power generating device comprising a boiler, a heat exchange water pipe passing through said boiler, a turbine and an electric power generator, and the exhaust gas outlet of said boiler being connected to said preheat section of said sintering device through an exhaust gas conduit.

4,392,354

CONSTANT PRESSURE AIR STORAGE INSTALLATION WITH WATER SUPPLY FOR GAS TURBINE POWER PLANTS

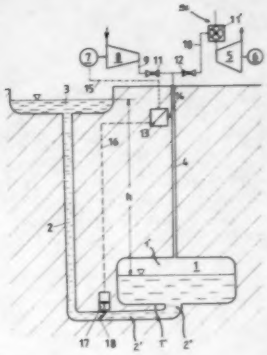
Alfred Schwarzenbach, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Oct. 2, 1980, Ser. No. 193,097

Claims priority, application Switzerland, Dec. 5, 1979, 10786/79

Int. Cl.³ F02C *9/14*

U.S. Cl. 60—727 **2 Claims**



1. A constant pressure air storage installation having a water supply for gas turbine power plants containing a gas turbine, comprising:

a subterranean cavern;

an air compressor;

an electric motor for driving the air compressor independently of the gas turbine;

said subterranean cavern serving for the storage of compressed air delivered by the air compressor;

connection lines extending between the cavern and the air compressor and the gas turbine;

a compensation basin;

a riser tube connecting the compensation basin with the cavern; and

means for regulating the throughflow resistance within the riser tube in dependency upon a course as function of time of a pressure drop arising within the cavern, in order to safeguard against unintentional outflow of water out of the cavern and through the riser tube, to thereby prevent blow-out of water from the cavern due to the action of the compressed air in the cavern.

4,392,355

COMBUSTION LINER

Albert J. Verdouw, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

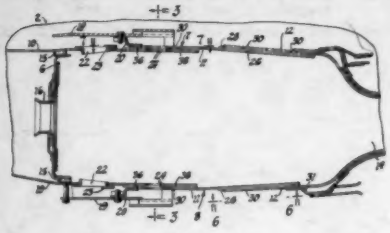
Filed Nov. 13, 1969, Ser. No. 876,254

Int. Cl.³ F23R *3/00*

U.S. Cl. 60—752 **3 Claims**

1. A combustion liner for a gas turbine engine combustion chamber or the like, the liner being of a type dividing an air space, from which combustion air is supplied, from a combustion space in which air and combustion products flow longitudinally of the liner to a combustion products outlet, the liner including a wall dividing the air space from the combustion space: the wall comprising, in combination, a forward wall section and a rearward wall section; the rearward wall section including a portion overlapping and outwardly spaced from the forward wall section, the forward wall section including a portion overlapping and inwardly spaced from the rearward wall section, the said portions defining between them an inlet

from the air space to the combustion space for cooling air to flow along the rearward wall section for film cooling of the rearward wall section; the said wall portions defining combustion air holes extending through the said wall portions for flow



transverse to the cooling air flow; barrier means blocking the cooling air inlet downstream of the combustion air holes; and auxiliary cooling air inlets defined by and extending through the rearward wall section into the cooling air inlet immediately downstream of the barrier means.

4,392,356

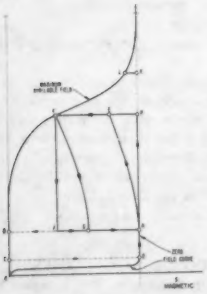
MAGNETIC HEAT PUMPING

Gerald V. Brown, Lakewood, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 829,319, Aug. 31, 1977, abandoned. This application Feb. 19, 1981, Ser. No. 235,868

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 **7 Claims**



1. A magnetic heat pump comprising:

a working component which is essentially a single ferromagnetic or ferrimagnetic material selected from the group consisting of rare earth elements and intermetallic compounds and alloys containing rare earth elements;

means for subjecting said component successively to a magnetic field to first, second, third and fourth strengths, and then back to said first strength; and,

means for changing said element successively from a first to a second temperature, then to a third temperature; then to a fourth temperature; and then back to said first temperature, said first, second, third and fourth temperatures coinciding with said first, second, third and fourth strengths of said magnetic field.

4,392,357

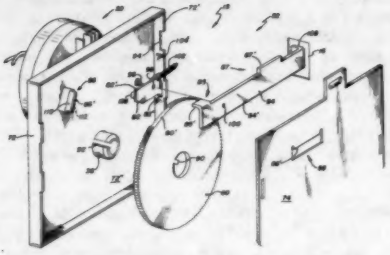
METHOD AND MEANS CONTROLLING DEFROST CYCLES OF A COOLING UNIT

Brian D. Kinsey, and Steven W. Smock, both of Indianapolis, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 27, 1981, Ser. No. 257,870

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—153 **7 Claims**



1. A control system for controlling defrost cycles of a cooling unit comprising:

(a) defrost means,

(b) cam means, constant speed drive means coupled to said cam means, and switch means responsive to said cam means controlling electrical current to said defrost means, and

(c) monitoring means coupled to said cam means and responsive to an opening and closing of a door of said cooling unit to intermittently advance said cam means so as to shorten time lengths between defrost cycles comprising a ratchet having a section void of teeth to prevent advancement of the ratchet during a defrost mode of operation, means coupling said ratchet to said cam means, and a pawl engaging said door and said ratchet to advance same in response to an opening of said door.

4,392,358

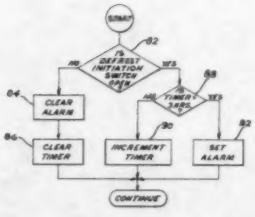
APPARATUS AND METHOD OF DETECTING FAILURE IN A REFRIGERATOR DEFROST SYSTEM

Frederick E. Hicks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 29, 1981, Ser. No. 278,302

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—155 **6 Claims**



1. The method of detecting defrost circuit failure in a refrigerating system having a refrigerating mode and a defrosting mode including an evaporator with an electric resistance heater in heat transfer relationship with the evaporator comprising:

energizing the heater periodically to initiate the defrost mode by actuating a normally open defrost initiation switch responsive to a timer,

de-energizing the heater responsive to a normally closed

defrost terminating thermostat switch opening at a predetermined elevated temperature,

periodically sensing for voltage across the normally open defrost initiation switch and generating a signal when voltage in the heater circuit is interrupted,

storing the multiple voltage signals generated in a memory bank over a predetermined period of time,

clearing the memory bank each time the defrost terminating thermostat switch closes, and

actuating an alarm when the voltage in the heater circuit is interrupted for the predetermined period of time.

4,392,359

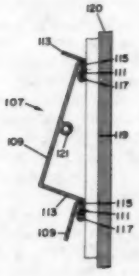
DIRECT EXPANSION SOLAR COLLECTOR-HEAT PUMP SYSTEM

James L. Franklin, Richland, Wash., assignor to Sigma Research, Inc., Richland, Wash.

Continuation of Ser. No. 857,569, Dec. 5, 1977, abandoned. This application Feb. 11, 1980, Ser. No. 120,227

Int. Cl.³ F25B *27/00, 13/00*

U.S. Cl. 62—235.1 **1 Claim**



1. A combined solar collector-heat pump heating system comprising at least one metallic surface member lying in a substantially vertical plane and secured to the exterior wall of a building, said metallic surface member comprising a plurality of long narrow parallel metal plates exposed directly to the ambient atmosphere and positioned to directly receive solar radiation, each plate comprising a main surface member extending horizontally, a tube extending longitudinally of said main surface member, in direct heat exchange relation therewith, a first flange extending longitudinally along a first edge of said main surface member and making an acute angle with the rear face of said main surface member, a second flange extending longitudinally along a second edge of said main surface member and extending rearwardly therefrom, and a footpiece extending from the rear edge of said second flange and lying substantially in a common vertical plane with said first flange, said footpiece being bent forwardly to form a U-shaped hook member, the footpiece of each plate being secured to the exterior wall of said building and the first flange of one plate being gripped in the hook member of an adjacent plate, said plates forming the exterior siding of said building, said tubes being joined together so as to form a conduit means, a compressor, an inlet line connecting a first end of said conduit means with the suction side of said compressor, a condenser means for extracting heat from said condenser, an outlet line connecting the high pressure side of said compressor with a first end of said condenser, a return line connecting a second end of said condenser with a second end of said conduit means, a restriction means in said return line, and a working fluid filling said conduit means, inlet line, compressor, outlet line, condenser, and return line, said working fluid having a boiling point such that it is vaporized in said conduit means and condensed in said condenser.

4,392,360

STRIP CURTAIN FOR DISPLAY TYPE REFRIGERATORS

Kenneth N. Gidge, and Henry J. Richard, both of Nashua, N.H., assignors to BSL Corporation, Nashua, N.H.

Filed Sep. 25, 1981, Ser. No. 305,462

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—249 **7 Claims**

1. A closure for disposition across the opening of a display refrigerator, comprising:

a plurality of strips extending over said opening;

first fastening means attached to at least certain of the strips on a given surface thereof for mounting the strips in proximity to the opening;

second fastening means attached to the refrigerator in proximity to an edge of the opening for reciprocally mating with and engaging the first fastening means on at least certain of the strips to releasably mount at least certain of the strips directly to the refrigerator in a substantially sidewise adjacent relationship to at least partially cover the opening; and

third fastening means attached to at least certain of the strips on a second given surface different from said first given surface for reciprocally mating with and engaging said first fastening means of an adjacent strip to releasably mount said strips together in a substantially superimposed stacked relationship to at least temporarily uncover at least a portion of the opening, thereby to allow at least certain of the strips to be attached to outer faces of certain other strips to facilitate loading and unloading of the refrigerator while maintaining the strips in locations convenient to the opening for rapid assembly and disassembly of the closure.

4,392,361

SELF-CONTAINED ICE CREAM APPARATUS

Alfredo Cavalli, Via Galileo Galilei 9, Pessano Con Bornago (Milano), Italy

Filed May 28, 1981, Ser. No. 267,874

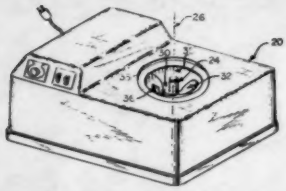
Claims priority, application Italy, May 30, 1980, 22480 A/80; Jul. 10, 1980, 23366 A/80; Dec. 2, 1980, 26354 A/80; Jan. 19, 1981, 19198 A/81

Int. Cl.³ A23G *9/00*

U.S. Cl. 62—343 **45 Claims**

1. A self contained apparatus for making an ice cream type mixture from a plurality of ingredients therefor comprising a mixing chamber having a base wall and a side wall with respect thereto, refrigeration means for controllably cooling the interior of said chamber, blade means rotatably mountable in said mixing chamber for rotation about an axis of said chamber, and means for controllably rotatably driving said blade means within said chamber about said axis, said blade means comprising means for scraping said side and base walls for forcing said ingredients from said side wall toward said axis and upwardly

away from said base wall and for forcing said ingredients from said axis toward said side wall and downwardly toward said base wall as said blade means rotates about said axis for stirring and intermixing said ice cream ingredients throughout said chamber interior, said blade means being configured and disposed for substantially continually transporting the warmer portions of the mixture toward the colder areas thereof and the colder portions of the mixture toward the warmer areas thereof during the rotation of said blade means for providing a substantially uniform temperature gradient for substantially the entire resultant ice cream mixture.



4,392,362

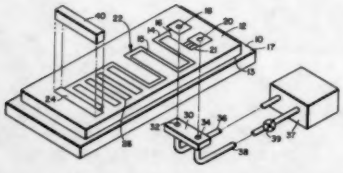
MICRO MINIATURE REFRIGERATORS

William A. Little, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 23,245, Mar. 23, 1979, abandoned. This application May 1, 1981, Ser. No. 259,688

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—514 R **26 Claims**



1. A compact refrigerator comprising a plurality of plate or platelike members all of materials having substantially the same coefficient of thermal expansion, means bonding said members together in sealed pressure-tight surface contact into a laminated structure and means forming in said structure a low-temperature chamber connected with input and output fluid ports by respective supply and return fluid passages, said supply passage being adapted for conducting incoming highly compressed gas and including a capillary or porous section leading into the cooling chamber whereby the incoming high-pressure gas is allowed to expand and reduce in temperature before entering said chamber, and said return passage having a section extending substantially coextensively in heat exchange relation adjacent at least part of said supply passage, and means whereby said chamber may be in heat exchange contact with a device to be cooled.

4,392,363

SLIDE FASTENER STRINGER WITH VENT HOLES

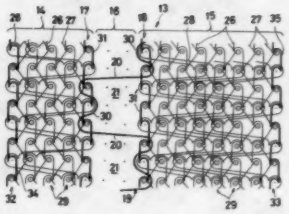
Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,309

Claims priority, application Japan, Nov. 27, 1979, 54-163930[U]

Int. Cl.³ D04B *23/08*

U.S. Cl. 66—193 **6 Claims**



1. A venting slide fastener stringer comprising:

(a) a warp-knit stringer tape including a pair of longitudinal warp-knit webs spaced transversely from each other, with a longitudinal wale-free region therebetween, and having a pair of marginal wales, respectively, confronting each other across said wale-free region, and a connecting thread having portions laid only in said marginal wales and substantially parallel adjacent portions all spaced longitudinally of and extending transversely across said wale-free region in a direction substantially perpendicular to said marginal wales, thereby defining a plurality of substantially rectangular vent holes longitudinally along said wale-free region, each of said webs comprising foundation threads constituting a plurality of wales juxtaposed across said each web, said marginal wales being composed of threads that are more rigid than said foundation threads; and

(b) a row of coupling elements mounted on one of said webs remotely from said wale-free region.

4,392,364

FLAT BED KNITTING MACHINE

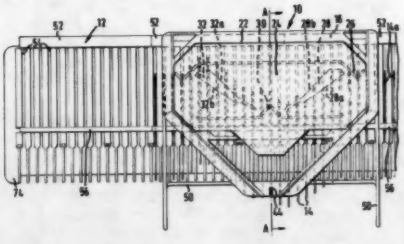
Roger F. N. Curry, 46, Cleveland Sq., London, W.2, England

Filed Mar. 2, 1981, Ser. No. 239,603

Claims priority, application United Kingdom, Mar. 13, 1980, 8008567

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—60 H **8 Claims**



1. A flat bed knitting machine comprising a flat elongate bed on which is retained a plurality of parallel, latchable, needles equally spaced along the length of the bed and each movable relative to the bed in a direction lengthwise of the needles and transverse of the bed length, a carriage slidably mounted on the bed for movement transversely of the needles, and a nee-

dle-engaging cam plate releasably located in a recess in an upper surface of the carriage and retained in the recess, the carriage having a handle gripped by the user of the machine to transverse the carriage back and forth along the length of the bed.

4,392,365

APPARATUS FOR TREATING TEXTILE MATERIAL FOR CONTINUOUS LENGTH

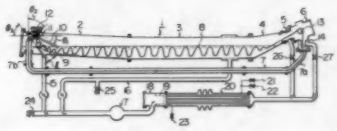
Mitsuyasu Miyamoto, Itami; Osamu Ishimaru, Matsubara, and Nobuyoshi Fukube, Takatsuki, all of Japan, assignors to Hisaka Works, Ltd., Osaka, Japan

Continuation of Ser. No. 213,615, Dec. 5, 1980, abandoned, which is a continuation of Ser. No. 84,072, Oct. 12, 1979, abandoned. This application Oct. 20, 1981, Ser. No. 313,320

Claims priority, application Japan, Oct. 18, 1978, 53-127265; Feb. 24, 1979, 54-23235

Int. Cl.³ D06B *3/28*

U.S. Cl. 68—19 **8 Claims**



1. An apparatus for treating a textile material in a continuous loop form, comprising a circular treating passageway comprised of a laterally elongated bath for allowing transient residence of the textile material while transferring the textile material in a zigzag form in a treating liquor, the level of said treating liquor being kept below half of the depth of the residence bath, a section for jetting the treating liquor connected to an outlet portion of the residence bath, and a passageway located generally below the bath for transferring the textile material along with a rapid flow of the treating liquid and having an outlet end connected to an inlet portion of the bath and an inlet end connected to an outlet portion of the treating liquor jetting section, at least one port for intaking the treating liquor provided in the bath, a suction pipe communicating with the port, a pump connected to the suction pipe for discharging treating liquor to the treating liquor jetting section and a heat exchanger downstream of the pump, characterized in that the residence bath is inclined so as to gradually increase the depth of the treating liquor in the advancing direction of the textile material, a baffle plate provided at the inlet portion of the bath above the level of the treating liquor at a prescribed interval of distance from the outlet end of the transfer passageway disposed so that the textile material strikes against the baffle plate above the level of the treating liquor in the bath, and a perforated plate is provided, with an inclination, below the baffle plate and on to which the textile material is deflected by the baffle plate for smooth advancement of the textile material.

4,392,366

FLOW CONTROLLER

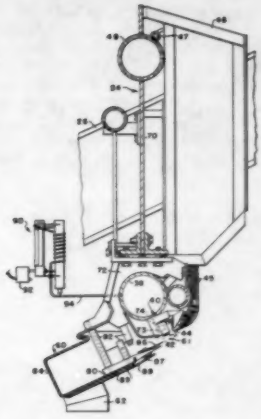
Thomas E. Godfrey, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 28, 1981, Ser. No. 258,410

Int. Cl.³ D06B *1/02*

U.S. Cl. 68—205 R **11 Claims**

1. Apparatus for applying non-Newtonian fluids moving material comprising: means for conveying the material in a pre-determined path of travel, liquid application means mounted above the path of travel of the material having a row of outlets positioned each having a discharge axis to discharge a corresponding row of generally parallel streams downwardly toward the path of travel of the material, manifold means supplying non-Newtonian fluid under pressure to said row of outlets, means to supply non-Newtonian fluid to said manifold means, fluid deflecting means having discharge axes positioned on one side of said row of outlets so that discharge axes of said fluid deflecting means intersect the discharge axes of the outlets for selectively deflecting the streams of liquid from said outlets away from the path of travel of the material, and a liquid collection chamber positioned on the other side of the discharge axes of the row of outlets from said deflecting means, said liquid collection chamber having an opening extending



along the row of outlets for receiving the deflected liquid streams to prevent their contact with the moving material, control means operably associated with said means to supply non-Newtonian fluid to control the flow of non-Newtonian fluid from said manifold means and flow rate sensing means operably associated with said manifold means to sense the pressure of the fluid being supplied to said outlets to automatically control the action of said control means to control the fluid flow rate from said outlets.

4,392,367

PROCESS AND APPARATUS FOR THE ROLLING OF STRIP METAL

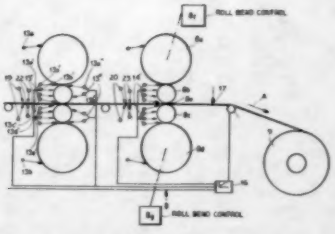
Wilfried Bald, Hilchenbach, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,015

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1979, 2927769

Int. Cl.³ B21B *37/10, 27/06*

U.S. Cl. 72—12 **13 Claims**



1. A method of operating a plane rolling line comprising a multiplicity of cold rolling stands, each having a pair of working rolls defining a gap, said gap being traversed by a strip of steel or nonferrous metal with said strip passing through a

penultimate stand and a last stand in succession prior to emerging from said line, the rolls of each stand being cooled by respective arrays of nozzles training coolant on the surfaces of said rolls, said method comprising the steps of:

(a) monitoring deviations from planarity of said strip at a location downstream of said last stand in the direction of movement of said strip through said line and across said strip, said deviations having a maximum value;

(b) proportionally controlling coolant flow through nozzles of said last stand exclusively in response to measured planarity deviation values up to a threshold planarity deviation less than said maximum deviation in a sense tending to reduce the measured deviations; and

(c) additionally controlling the nozzles of at least said penultimate stand in response to the measured deviation values only upon the measured deviation values exceeding said threshold, said threshold planarity deviation corresponding to substantially 30% of said maximum value, the control of the flow of coolant being effected by directing coolant only along the upstream side on the surface of the rolls of the last stand and by directing coolant on both the upstream and downstream sides of the rolls of the other stands.

6. In a cold-rolling line for the cold reduction of steel or nonferrous metal strip, wherein said strip is passed in succession between working rolls of a multiplicity of rolling stands and respective arrays of nozzles at each of said stands train coolant onto surfaces of the respective rolls, said strip passing through a penultimate stand and a last stand prior to emergence from said line, the improvement comprising:

(a) means for monitoring the planarity of said strip downstream of said last stand in the direction of movement of said strip for producing signals representing deviations from planarity at locations across said strip;

(b) means responsive to said signals for controlling the nozzles of said last stand exclusively upon the detection of planarity deviations up to a threshold value of substantially 30% of the maximum deviation of planarity; and

(c) means automatically responsive to said signals for additionally controlling the nozzles of said penultimate stand upon the measured planarity deviation exceeding said threshold value, the means responsive to said signals being constructed and arranged to controlledly cool the rolls of said penultimate and last stands so as to reduce the measured deviation, said means responsive to said signals including a proportional controller, said nozzles being provided only on the upstream side of said last but on both the upstream and the downstream sides of the other stands of said line.

4,392,368

ARRANGEMENT FOR PRESSES

Hans Folkesson, Trollhättan, and Ulf Überg, Gothenburg, both of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

PCT No. PCT/SE79/00093, § 371 Date Dec. 17, 1980, § 102(e) Date Nov. 24, 1980, PCT Pub. No. WO80/02239, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 17, 1979, Ser. No. 216,998

Int. Cl.³ B21D *22/12*

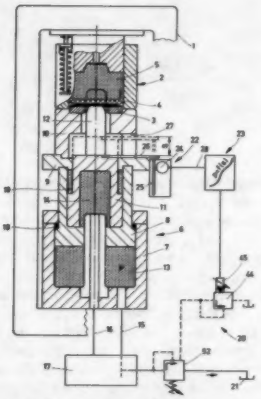
U.S. Cl. 72—63 **5 Claims**

1. Apparatus for a sheet metal forming press wherein there is at least one component which moves in relation to another part of the press during a forming operation and is controlled in its movements by hydraulic fluid under pressure, said apparatus providing for control of the pressure of said hydraulic fluid in accordance with a predetermined but readily alterable program of relationships between position of said component and magnitude of said pressure, and said apparatus comprising a position transducer that produces a position output which varies in dependence upon the position of said component and pressure regulating means for changing the magnitude of said pressure in correspondence with changes in value of a characteristic of an electrical control current fed to said pressure regulating means, said apparatus being characterized by:

(A) a plurality of elongated, laterally spaced apart position conductors, one for each of a plurality of positions of said component, all extending substantially in one direction;

(B) a plurality of elongated, laterally spaced apart pressure value conductors, one for each of a plurality of magnitudes of said pressure and each extending transversely to all of said position conductors but out of contact with them to be electrically connectable to any selected one of said position conductors by means of a readily disconnectable connector;

(C) input current means normally connected with all of said pressure value conductors for feeding an input current to all of them that has a magnitude for each of them which is different from that of the input current fed to the others and which, for each, corresponds to a unique magnitude of said pressure;



(D) circuit control means comprising:

(1) a decoder connected with said position transducer to receive said position output therefrom, and

(2) means under the control of said decoder for establishing each of said position conductors selectably and alternatively in a state of connection with said pressure regulating means or in a state of disconnection therefrom and whereby the position conductor for the existing position of said component is established in one of said states and all of the others are maintained in the other of said states; and

(E) electrical circuit means for so connecting all of said pressure value conductors with said pressure regulating means as to feed to the latter a control current having a value that substantially corresponds to the magnitude of the input current fed to a pressure value conductor connected with the position conductor that is in its said one state.

4,392,369

DIAGONAL ROLLING OF HOLLOW STOCK

Detlef Ramdohr, Krefeld; Walter Knauf; Karl-Heinz Bressing, both of Düsseldorf, and Rolf Kümmerling, Essen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,178

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3013127

Int. Cl.³ B21B *19/06*

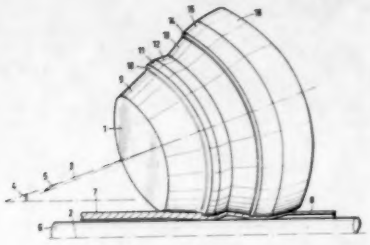
U.S. Cl. 72—96 **3 Claims**

1. In a diagonal rolling mill for stretching seamless hollows, using at least two rolls of overall truncated configuration,

being arranged in a common plane of rolling transverse to an axis of rolling and having obliquely disposed axes, further being oriented so that a smaller end of each of the rolls faces the oncoming hollow, the improvement comprising, in combination, each of the rolls having:

a first annular, radially projecting working shoulder, projecting from the conical smaller end;

a second, larger, annular, radially projecting working shoulder;



an annular recess between the shoulders and a conical surface as transition from the recess to the second shoulder; and

a circular cylindrical mandrel rod for coaction with the rolls, wherein said first shoulder urges material of the hollow against the mandrel for reducing the wall thickness of the hollow and stretching same, said recess receiving material radially displaced because of the stretching, the second shoulder further stretching the hollow, all in coaction with the cylindrical mandrel.

4,392,370

TWO-HIGH ROLLING STAND FOR BAR AND/OR WIRE ROLLING MILL

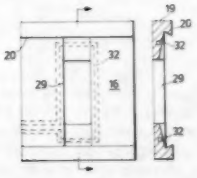
Per-Olof Strandell, Bockstigen 3, 183 51 Täby, Sweden

Filed Oct. 20, 1980, Ser. No. 198,593

Claims priority, application Sweden, Oct. 23, 1979, 7908779

Int. Cl.³ B21B *31/02*

U.S. Cl. 72—201 **13 Claims**



1. A two-high rolling stand for use in a plurality of stands constituting a rolling mill comprising a roll package having a pair of rolls with axial directions arranged in parallel, said roll package including bearing devices and housing therefor operable to support said rolls within said stand, end members arranged to exert force on said roll package, each of said end members having a roll gap adjustment means associated therewith for exerting force between said rolls, a pair of side plates arranged to contact said end members on either side thereof along a pair of planes parallel to the axial direction of said pair of rolls, said side plates releasably engaged with said end members and arranged to take up the roll forces exerted by said roll package, and said side plates having the main extension planes thereof substantially in parallel with a plane passing through the center lines of said pair of rolls.

4,392,371

METHOD OF PLATE ROLLING AND EQUIPMENT THEREFOR

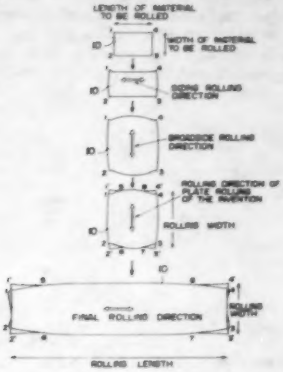
Taketo Okumura; Taiji Tsukahara; Takashi Mikuriya; Hideki Watanabe, and Katsutoshi Katada, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 167,122, Jul. 9, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,838

Claims priority, application Japan, Jul. 13, 1979, 54-89567

Int. Cl.³ B21B *1/02*

U.S. Cl. 72—231 **4 Claims**



1. A method for manufacturing a heavy plate having no side crop portions bulging outwardly by rolling a rectangular slab, comprising the steps of:

rolling said slab in the longitudinal direction thereof;

rolling said slab in the lateral direction perpendicular to the longitudinal direction of said slab;

rolling opposite end portions of said slab by upper and lower rolls in said lateral direction of said slab with a gap between said upper and lower rolls being tapered toward axially outer directions of said upper and lower rolls so that said end portions are bevelled, whereby each corner of said end portions projects outwardly; and

forming said heavy plate by rolling said slab having bevelled end portions in said longitudinal direction of said slab.

4,392,372

METHOD AND APPARATUS FOR FLANGING TUBE ENDS

Alexander Brodsky, and Richard J. Clark, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Feb. 20, 1981, Ser. No. 236,272

Claims priority, application New Zealand, Mar. 3, 1980, 193022

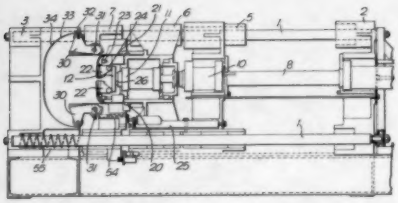
Int. Cl.³ B21D *7/04, 51/18*

U.S. Cl. 72—311 **11 Claims**

1. A method of flanging one end of a thin metal tube comprising the steps of mounting a sheet metal tube on a carriage, clamping the tube to the carriage, placing complementary pivotal inner and outer forming tools with parts thereof in contact with the inner and outer surfaces respectively of one end portion of said tube, the inner forming tools being pivotal on an inner frame and the outer forming tools being pivotal on an outer carriage, and forming a radially inwardly directed flange on said one end portion by pivotally moving the inner and outer forming tools with said tube end portion between them to displace said one end portion radially inwardly and form ribs thereon, and moving the pivot axes of said forming tools relatively to each other in a direction parallel to the tube axis and slidingly with respect to said one end portion during

the formation of said flange and ribs to produce said flange having a cross-sectional shape which includes two sets of oppositely directed ribs the sides of which increase in depth from the tube wall towards the tube center.

7. Apparatus for flanging and ribbing one end of a thin metal tube comprising a frame, a plurality of rod members extending between the ends of said frame and along an axis of said frame, an outer carriage slidable on said rod members, a plurality of radially extending circumferentially spaced outer forming tools pivotally mounted on said outer carriage so as to be substantially radially pivotal through substantially 90°, an intermediate carriage slidable on said rod members, clamping means on said intermediate carriage to clamp a tube to be flanged thereon with the tube axis oriented parallel to said axis of said frame, a plurality of radially extending circumferentially spaced inner forming tools pivotally mounted on said intermediate carriage for substantially radially pivotal movement through substantially 90°, means to cause said outer forming tools to pivot through said substantially 90°, and force supplying means operatively connected to said inner and outer forming tools to move said inner and outer forming tools with respect to said frame and each other in a manner such that a radially inwardly directed flange on one end of said tube disposed between said forming tools is formed, said flange having a width less than the radius of the tube and a cross-sectional shape in the form of a series of two sets of oppositely directed ribs the sides of which increase in depth from the tube wall towards the tube center, said force supplying means including means to displace the pivotal axes of said tools with respect to each other in a direction parallel to the frame axis during formation of the flange.



4,392,373

FORMING MEANS

Richard J. Clark, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, New Zealand

Filed Jul. 23, 1980, Ser. No. 171,421

Claims priority, application New Zealand, Jul. 27, 1979, 191145

Int. Cl.³ B21D *11/04*

U.S. Cl. 72—321 2 Claims

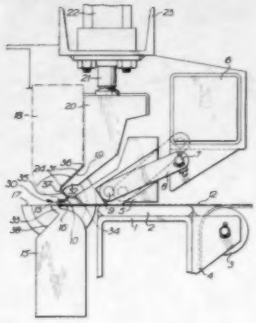
1. A sheet bending apparatus for forming a substantially S shaped formation in a piece of sheet metal comprising

clamping means for holding the piece of sheet metal;

a single surface shaped to provide a first bend in the piece of sheet metal;

a first forming means rotatable about an axis between a first position and a second position for bending the sheet metal to conform to a portion of said single anvil surface to form a first, 180° bend in the piece of sheet metal; and

a second forming means linearly displaceable towards said single anvil surface from a third position to a fourth position for forming a second bend in the piece of sheet metal



to complete the S shaped formation in the piece of sheet metal.

4,392,374

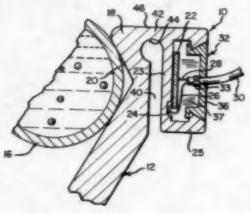
TRANSDUCER COUPLING APPARATUS FOR INHOMOGENEITY DETECTOR

Leonard N. Liebermann, La Jolla, Calif., assignor to Tif Instruments, Inc., Miami, Fla.

Filed Jun. 8, 1981, Ser. No. 271,257

Int. Cl.³ G01N *29/02*

U.S. Cl. 73—19 6 Claims



1. In a detector for detecting inhomogeneities in fluid flowing through a conduit including electro-mechanical transducer assemblies disposed on the wall of such conduit in an acoustically coupled relationship with substantially all acoustic coupling occurring through such conduit and means for sensing variations in a driving signal supplied to a transducer on one of said transducer assemblies caused by such inhomogeneities, the improvement comprising:

an acoustically conductive coupling member for coupling a transducer to such conduit; said coupling member including;

a first portion configured with a surface for contacting such conduit wall over an area sufficient to transmit mechanical energy between the member and such conduit wall; and

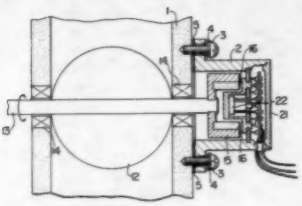
a second portion spaced apart from such conduit wall upon which a transducer is mounted;

said first and second portions being partially acoustically coupled together to form a mechanical filter means for mechanically filtering out undesirable oscillations resulting from vibrational modes of the conduit and coupling member system in which acoustic energy travels primarily in the conduit, rather than in the fluid.

4,392,375
ROTATIONAL ANGLE DETECTING APPARATUS

Osamu Eguchi, Anjo; Mitsutoshi Hattori, Okazaki, and Takatsugu Hanaoka, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 26, 1981, Ser. No. 228,551
Claims priority, application Japan, Jan. 30, 1980, 55-9779
Int. Cl.³ G01M 19/00; G08C 19/04
U.S. Cl. 73—118 2 Claims

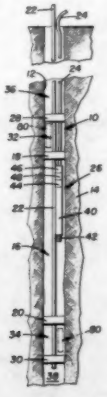


1. A rotational angle detecting apparatus comprising:
a throttle valve rotatably mounted in a throttle body;
a yoke made of a magnetical material and fixed to a shaft of said throttle valve;
a pair of permanent magnets so fixed to said yoke with a space, to generate a parallel magnetic field in said space; and
magnetic sensing means adjustably mounted in a support in said space to generate an electrical output in response to an angular displacement of said permanent magnets with respect to said magnetic sensing means, said magnetic sensing means including a ferromagnetic metal magnetoresistance element whose electric resistance varies in dependence on changes of an angle formed by a direction of the magnetic field and a direction of a current flowing therethrough.

4,392,376
METHOD AND APPARATUS FOR MONITORING BOREHOLE CONDITIONS

Peter L. Lagus, Olivenhain; Edward W. Peterson, Del Mar, and William O. Hicks, San Diego, all of Calif., assignors to S-Cubed, San Diego, Calif.

Filed Mar. 31, 1981, Ser. No. 249,622
Int. Cl.³ E21B 47/10
U.S. Cl. 73—155 35 Claims

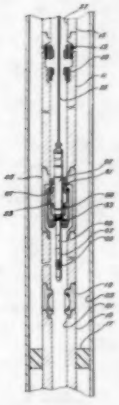


1. In a method for monitoring flow conditions within a test interval of a borehole, the borehole being filled with a substantially incompressible fluid capable of flow between the test interval and the surrounding formation, the steps comprising
developing a pressure differential between the test interval and the surrounding formation for inducing flow therebetween,
arranging a variable volume device in communication with the test interval, and
varying the effective volume of the variable volume device in order to limit pressure variation in the test interval and minimize system compliance effects while simultaneously monitoring selected flow conditions within the test interval, operation of the variable volume device being regulated in order to maintain substantially constant pressure within the test interval.

4,392,377
EARLY GAS DETECTION SYSTEM FOR A DRILL STEM TEST

E. Edward Rankin, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Sep. 28, 1981, Ser. No. 305,947
Int. Cl.³ E21B 47/00
U.S. Cl. 73—155 9 Claims



1. In a method for providing concurrent surface indication of earth formation characteristics during drill stem testing, the method including the steps of running in on a drill string a releasable packer and a bypass sub having a bore for sealingly receiving a wireline tool and a bypass passage means permitting formation fluid flow around the wireline tool, then selectively opening and closing the bypass passage means with the wireline tool sealed in the bore and the packer set to selectively shut in and allow formation fluid flow to the surface while concurrently providing to the surface through the wireline formation flowing and shut in characteristics sensed by the wireline tool, the improvement comprising:
providing for the wireline tool, sensing means for sensing the gas content of the formation fluid and providing a concurrent indication to the surface;
providing a reversing valve means for communicating a well annulus with the interior of the drill string while the wireline instrument is located downhole;
stopping the flow of formation fluid should the sensing means indicate the possibility of a gas flow rate above a selected safe minimum; then
reversing circulating annulus fluid from the annulus down through the reversing valve means and up the drill string to remove formation fluid from the drill string; then
removing the wireline tool.

4,392,378

CAPACITANCE MEASURING APPARATUS

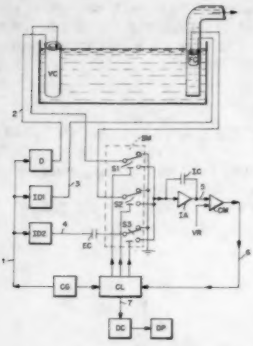
Brian E. Pitches, Lothian; Robert M. S. Murray, Edinburgh, and Douglas J. Rogers, Midlothian, all of Scotland, assignors to 501 Ferranti Limited, Hellinwood, England

Filed Aug. 25, 1980, Ser. No. 180,885

Claims priority, application United Kingdom, Sep. 1, 1979, 7930387

Int. Cl.³ G01F *23/26;* G01R *27/26*

U.S. Cl. 73—304 C 8 Claims



1. Capacitance measuring apparatus which includes a variable capacitor and a first reference capacitor, means for generating a periodic voltage waveform for application directly to the variable capacitor and means for generating the periodic waveform in inverted form to the reference capacitor, an integrator, switching means for connecting the variable capacitor and the reference capacitor sequentially to the input of the integrator, comparison means for comparing the output of the integrator with a reference level, control means responsive to the output of the comparison means to control a sequence of operation of the switching means and to deliver an output pulse train, and output means responsive to the output pulse train to determine the capacitance of the variable capacitor relative to that of the reference capacitor.

4,392,379

ULTRASONIC DIAGNOSTIC EQUIPMENT

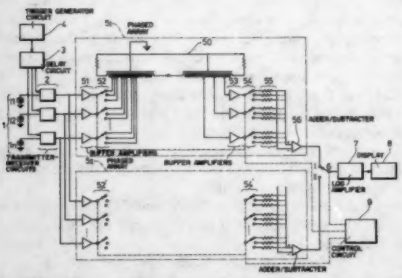
Keiki Yamaguchi, Musashino, Japan, assignor to Yokogawa Electric Works, Tokyo, Japan

Filed Feb. 5, 1981, Ser. No. 231,849

Claims priority, application Japan, Feb. 12, 1980, 55-15887

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 4 Claims



1. In an ultrasonic diagnostic equipment having an ultrasonic transducer which emits ultrasonic pulses to an acoustic field to be examined and receives reflected ultrasonic waves therefrom for obtaining a tomogram of said acoustic field, said ultrasonic diagnostic equipment including:

first and second channels having phased arrays of different adjustable focal sections

means for alternatively operating said first and second channels during the reception of said reflected ultrasonic waves, and

switch means for adjusting the focal sections of the phased array of each of said first and second channels when the other of said first and second channels is in operation receiving said reflected waves from said acoustic field whereby tomograms of high revolution are obtained without being influenced by spike noise due to adjustments in the focal sections of the phased arrays.

4,392,380

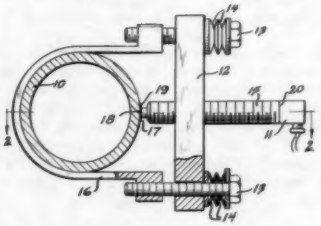
HIGH TEMPERATURE PRESSURE COUPLED ULTRASONIC WAVEGUIDE

Michael J. Caines, Forest Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 11, 1981, Ser. No. 233,354

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—644 7 Claims



1. A device for ultrasonically monitoring the characteristics of a material comprising:

a threaded waveguide;

a transducer coupled to one end of the waveguide;

a treated copper foil positioned between the material and the other end of the waveguide, wherein the treatment of said treated foil comprises annealing and polishing to render the foil soft and smooth;

an adjustable holding fixture for positioning the waveguide against the foil and against the material; and

force compensating means for maintaining substantially constant pressure against the waveguide and against the material during creep of said fixture wherein said force compensating means is positioned far enough away from the material so as not to be exposed to temperatures of such a high level as to cause relaxation of said force compensating means.

4,392,381

DRIVER BAR ASSEMBLY

Robert W. Martin, West Covina, Calif., assignor to Kimball Industries, Inc., Monrovia, Calif.

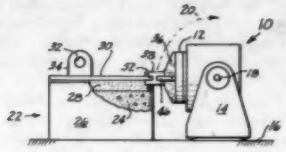
Filed Aug. 10, 1981, Ser. No. 291,333

Int. Cl.³ B06B *1/00, 3/00*

U.S. Cl. 73—663 21 Claims

1. Driver bar assembly comprising a bar element and a retainer element separably connected thereto; said bar element having a normally vertically disposed base attachable to a pivotally mounted shaker head and a normally horizontally disposed flange adapted to lie in a common plane with and spaced from a slip plate to be driven by said shaker head; said retainer element having first bracket means in which said bar

element flange is bracketable, and second bracket means in which said slip plate is bracketable opposite said bar element flange, whereby said flange and slip plate spacing is bridged in vibration transmitting relation between said shaker head and said slip plate; said retainer element being separable from said



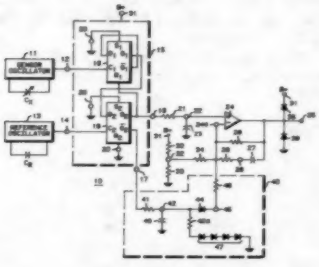
slip plate and said bar element flange without relative movement of said slip plate and shaker head, said bar element and shaker head being freely angularly movable relative to said slip plate in the separated condition of said retainer element and said bar element.

4,392,382

LINEARIZED ELECTRONIC CAPACITIVE PRESSURE TRANSDUCER

Donald O. Myers, Carpentersville, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 9, 1981, Ser. No. 241,888
Int. Cl.³ G01L *19/04, 19/12*
U.S. Cl. 73—708 **12 Claims**



1. A linearized electronic pressure transducer operative over a range of temperature comprising:

first means for providing a first analog signal having a magnitude varying as a predetermined function of sensed pressure;

non-linear circuit means coupled to said first means for recieving a signal therefrom and in response thereto effectively providing an analog control signal having a magnitude varying as a predetermined non-linear function of said first analog signal magnitude;

output circuit means coupled to both said first means and said non-linear circuit means for receiving both said analog control signal and said first analog signal and providing an ouput signal having a magnitude varying as a substantially linear function of sensed pressure, said output circuit means utilizing said control signal magnitude to modify the magnitude variation provided by said first analog signal to produce said linearly varying output signal; and

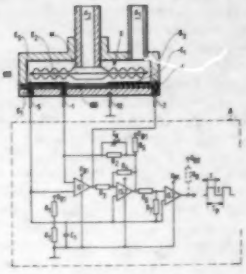
temperature compensation means operatively coupled to said output circuit means for providing temperature compensation for said output signal and thereby providing a substantially linear variation of said output signal as a function of pressure over a range of temperature.

4,392,383

DISTANCE-FREQUENCY TRANSDUCER

Hans Bauerlen; Thomas Pfendler, both of Gerlingen, and Berthold Wocher, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,783
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011594; Oct. 7, 1980, 3037802
Int. Cl.³ G01L *9/12*; H01G *7/00*
U.S. Cl. 73—724 **10 Claims**



1. Pressure transducer comprising

an RC oscillator circuit including

a measuring capacitor having a capacitance (C) varying in dependence on pressure, and determining the frequency of the RC oscillator circuit, said capacitor having

a fixed electrode (E1) and a movable electrode (E2);

wherein the fixed electrode comprises a layer of electrically conductive material surrounding a central area which comprises non-conductive material (100),

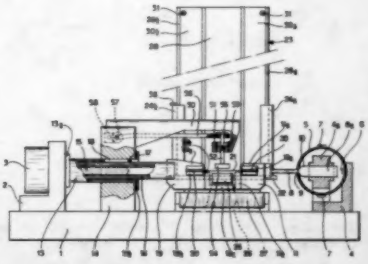
and wherein the movable electrode comprises a metallic, corrugated membrane (M) having a surface facing said fixed electrode, said membrane (M) forming a pressure pick-up (D) and being movable relative to said fixed electrode (E1) as a function of pressure applied thereon.

4,392,384

MEASURING INSTRUMENT WITH AUTOMATIC LOADING AND AN AUTOMATIC CYCLE, FOR STUDYING THE TENSILE CHARACTERISTICS OF FIBRES

Jean-Pierre Yquel, Colombes, France, assignor to L'Oreal, Paris, France

Filed Sep. 14, 1981, Ser. No. 301,833
Claims priority, application France, Sep. 22, 1980, 80 20331
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—830 **19 Claims**



1. In a measuring instrument for measuring the deformations of and tensile forces in a sample fibre or analogous material when subjecting the sample to a longitudinal tensile stress and

which comprises a frame, a tensioning means carried on the frame and including a movable element to be associated with one, movable, end of the sample and a force detector also carried on the frame and including means to be associated with the other, fixed, end of the sample, the improvement in that the said instrument comprises a feed plate; a plurality of pairs of sample blocks with the sample blocks of each pair being provided with means firmly to hold opposite ends of a sample to be tested; a sample loader provided with means to receive a plurality of said pairs of sample blocks stacked with the samples carried thereby parallel one with the other, said sample loader having a discharge axis perpendicular to the direction of extent of said samples and being held fixed relative to the frame with the extent of the stack perpendicular to said feed plate; a feed device capable of pushing a pair of sample blocks perpendicularly to a plane formed by the samples in the loader while said pair of sample blocks is carried by the feed plate from an initial position located in line with the loader, with simultaneous translational movement of the two sample blocks to a loaded position; two clamps one of which is fixed and cooperates with the force detector while the other cooperates with the movable element of the tensioning means, said sample blocks in their loaded position being received in said clamps, the said feed device being retractable to its initial position to engage a new pair of sample blocks carried by the feed plate; control means for triggering the operation of the tensioning means when the sample blocks are in position in the said clamps; one measuring means, associated with the force detector, providing the value of the tensile force applied to the sample; other measuring means, associated with the movable element of the tensioning means, providing the value of the elongation of the sample; and means for returning the tensioning means to an initial position after its movable element has been subjected to sufficient translational movement for the measurement, said feed device being operable, when bringing a new pair of sample blocks into the clamps, to cause the previous two sample blocks to be driven out from the said clamps.

4,392,385

FLOW METER UTILIZING KARMAN VORTEX STREET

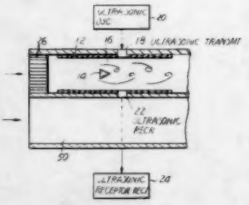
Kuniteru Okuda; Teruki Fukami, both of Tokyo; Yoshiaki Asayama, Himeji; Shunichi Wada, Himeji, and Masami Kabuto, Himeji, all of Japan, assignors to Oval Engineering Co., Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 956,599, Oct. 30, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 185,387

Claims priority, application Japan, Nov. 4, 1977, 52-148024[U]; Jun. 12, 1978, 53-80067[U]; Sep. 7, 1978, 53-123314[U]; Sep. 20, 1978, 53-129325[U]

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.23 **1 Claim**



1. A flow meter utilizing a Karman vortex street and comprising a conduit with a rectangular cross-sectional profile and divided into at least two parallel conduit portions through which a fluid to be measured flows, said at least two parallel conduit portions being substantially identical in transverse cross-sectional shape to each other, a laminar flow producing means in the upstream end of one of said conduit portions, a vortex generating member disposed in said one conduit portion perpendicularly to the direction of flow of the fluid to generate the Karman vortex street downstream thereof, a vortex detector disposed on said one conduit portion and directing an ultrasonic wave perpendicularly across the Karman vortex street and receiving the ultrasonic wave to detect the number of vortices of the Karman vortex street generated in a unit time, said vortex detecting generating an ultrasonic wave of the type which, unless preventive measures are taken, tends to generate a standing wave at the receiving side of said one conduit portion, and a sound absorbing material only on the inner wall of said one conduit portion at least along the portion where the ultrasonic waves exist for preventing the generation of a standing wave due to reflection of the said ultrasonic waves, whereby the flow rate of said fluid flowing through said plurality of conduit portions can be determined from measuring the flow rate of the portion of said fluid flowing through said one of said conduit portions.

4,392,386

FLOW RATE METER

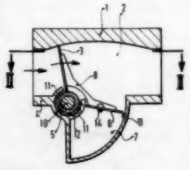
Manfred Knetsch, and Peter Romann, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,811

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042448

Int. Cl.³ G01F *1/28*

U.S. Cl. 73—861.76 **9 Claims**

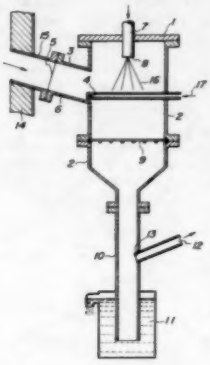


1. A flow rate meter having a housing, said housing having a flow conduit in which a measuring body is disposed, said measuring body pivotable about a bearing shaft mounted in said housing counter to a restoring force, said measuring body being arranged to pivot in accordance with a quantity of medium flowing therethrough, said flow rate meter further having a damping body pivotable about said bearing shaft so as to define a damping chamber with respect to said flow conduit, said flow rate meter being intended in particular for measuring a quantity of air aspirated via an air intake tube by an internal combustion engine, characterized in that said measuring body and said damping body are rigidly coupled to one another by means of at least one crosspiece, said measuring body and said damping body comprising flow rate elements, one of said flow rate elements being directly connected with a hub provided on said bearing shaft in a rotationally fixed manner, said housing further being provided with a wall extending arcuately about said hub, and said wall and said hub provide therebetween a leakage gap terminating at one end outside said damping chamber downstream of said measuring body.

4,392,387
SAMPLING DEVICE FOR ANALYZING GAS WITH HIGH DUST CONTENT

Naoe Izumi, Mie, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 14, 1981, Ser. No. 253,918
Claims priority, application Japan, Apr. 28, 1980, 55-58448[U]
Int. Cl.³ G01N 1/24
U.S. Cl. 73—863.21 5 Claims

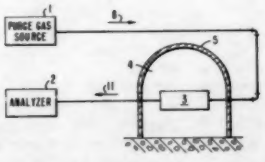


1. A sampling device for analyzing gas with a high dust content, comprising a generally closed housing (2), a gas suction tube (3) of a large diameter connected to an upper portion of the housing so as to lead the gas with the high dust content into the inside of the housing, an air-jet nozzle (4) disposed in said gas suction tube (3) in the proximity of joint between said tube (3) and said housing (2), said nozzle (4) facing tube wall (6) of said gas suction tube (3) and being directed toward inlet opening (5) thereof, a water supply conduit (7) connected to a top portion of said housing (2) so as to supply water for washing the gas with the high dust content led into the housing (2), a screen (9) disposed at a lower portion of said housing (2), a water sump (11) connected to a bottom portion of said housing (2) through a pipe (10), and a washed-gas passage (12) having one end thereof connected to said pipe (10) and an opposite end thereof communicated with outside of the sampling device.

4,392,388
GAS SAMPLER FOR AEROSOL ATMOSPHERE

James E. Bauerle, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1981, Ser. No. 235,208
Int. Cl.³ G01N 1/26
U.S. Cl. 73—863.23 3 Claims



1. A sampler for gathering a sample of a gas from an environment containing an aerosol of tramp material in said gas which comprises:

(a) a purge gas source;

(b) a barrier having ports between two surfaces thereof, said ports adapted to permit back-diffusion of said sample of a gas therethrough, by virtue of said ports being of a size which is larger in diameter than one mean free path of molecules of said sample gas;

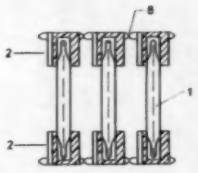
(c) a sampler probe supporting said barrier such that a first surface of said surfaces of said barrier is presented to said environment and said sampler probe further defining a chamber with said barrier adapted to receive and channel flow of purge gas from said purge gas source over a second surface of said surfaces of said barrier such that a portion of the said purge gas flow passes through said ports in said barrier thereby inhibiting clogging of said ports by said aerosol of tramp material in said gas and the remaining portion of the purge gas flow gathers such amount of sample gas in said chamber as has back-diffused through said ports across said barrier; and

(d) an analyzer adapted to receive the purge gas flow from said sampler probe, the purge gas flow containing additionally such amount of the sample of said gas as has back-diffused across said barrier.

4,392,389
SAMPLING TUBE HAVING CLOSING CAPS

Wolfgang Eckstein, Sereetz; Horst Rabenecker, Klein Parin, and Jürgen Behnke, Lubeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 299,078
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037826
Int. Cl.³ G01N 1/00; B65D 21/02, 85/20; B01L 3/12
U.S. Cl. 73—864.91 3 Claims



1. An improved sampling tube arrangement of the type having an elongated sampling tube with closing caps made of an elastic plastic adapted to be received upon and close the ends of the sampling tube, comprising a plurality of the closing caps, webs connecting adjacent closing caps to form a string of closing caps, each of said webs being severable between adjacent closing caps, reconnecting means for reconnecting two adjacent closing caps to each other, said reconnecting means including a plug-in connection comprising a male part provided on one side of the closing cap and a fitting female part adapted to fittingly receive the male part of an adjacent connecting cap provided on the other side of the closing cap, and each cap having an area intermediate said sides for labeling.

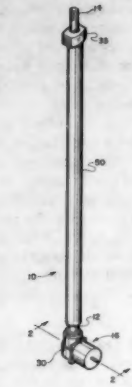
4,392,390
SHIELDING APPARATUS FOR LINEAR ACTUATOR

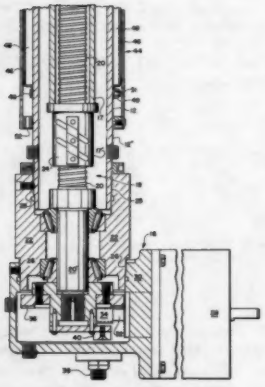
James C. Johnson, Charlotte, N.C., assignor to Duff-Norton Company, Charlotte, N.C.

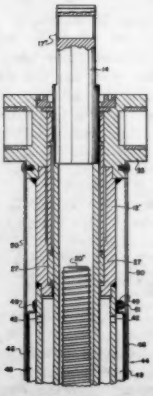
Filed Mar. 2, 1981, Ser. No. 239,183
Int. Cl.³ F16H 27/02
U.S. Cl. 74—89.15 7 Claims

1. In a linear actuator of the type having a housing and a reciprocable member disposed in and projecting from said housing for reciprocating linear movement relative thereto, said housing having vent means for admitting to and exhausting from said housing ambient air responsive to fluctuations in the volumetric capacity of said housing resulting from the relative reciprocal movement of said reciprocable member respectively out of and into said housing, the improvement

comprising means for shielding said vent means to prevent entrance of airborne debris and excess moisture into said housing while permitting unrestricted operational airflow through said vent means, said shielding means including bladder means sealably affixed externally to said housing surrounding said vent means for expansionally receiving and containing air exhausted through said vent means from said housing upon decreases in the volumetric capacity of said housing resulting from reciprocal movement of said reciprocable member into said housing and for contractionally expelling contained air through said vent means into said housing upon increases in the volumetric capacity of said housing resulting from reciprocal movement of said reciprocable member out of said housing, whereby a controlled predetermined volume of air may be constantly contained within and maintained in equilibrium between said housing and said bladder means to facilitate unrestricted operation of said linear actuator while preventing entrance thereinto of external airborne debris and excess moisture.





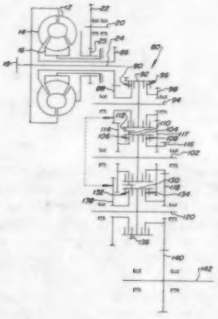


4,392,391

MULTISPEED REVERSIBLE POWER SHIFT TRANSMISSION

James J. Jameson, and John M. Beeson, both of Coffeyville, Kans., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 7, 1980, Ser. No. 204,817
Int. Cl.³ F16H *3/08*
U.S. Cl. 74—333 **1 Claim**



1. A multispeed constant mesh gear transmission including an input shaft and an output shaft, said transmission being operable to provide six speed ratios between said input shaft and said output shaft in one direction of rotation of said output shaft and three speed ratios between said input shaft and said output shaft in the opposite direction of rotation of said output shaft, said transmission comprising:

an input gear drivenly connected to said input shaft and rotatable about an input axis;

a first clutch set including a first directional clutch and a first speed change clutch drivingly engageable with each other and disposed about a first axis spaced from said input axis;

a second clutch set including a second directional clutch and a second speed change clutch drivingly engageable with each other and disposed about a second axis spaced from said first axis and said input axis

a third clutch set including a third directional clutch and a third speed change clutch drivingly engageable with each other and disposed about a third axis spaced form a said input, first, and second axes;

first, second and third gears disposed for rotation about said about said first, second, and third axes, respectively, and respectively engageable through said respective first, second and third clutch sets with fourth, fifth and sixth gears disposed for rotation about first, second and third axes, respectively;

a seventh gear fixed to said fifth gear for rotation about said second axis;

said first gear being meshed with said third gear, said fourth gear being meshed with said fifth gear, said seventh gear being meshed with said sixth gear, and said second gear being meshed with said first gear.

eighth and ninth gears meshed with each other and respectively associated with said first and second clutch sets for drivingly interconnecting said first gear with said fifth and seventh gears through said first directional clutch and said second speed change clutch;

a tenth gear associated with said third clutch set and meshed with said ninth gear for drivingly interconnecting said first gear with said sixth gear through said first directional clutch and said third speed change clutch;

an output gear drivingly connected to said output shaft and mounted for rotation about an output axis spaced from said third axis, said output gear being meshed with said sixth gear,

said input axis, said third axis and said output axis lying in a common plane, and said second and third axes lying in a common plane intersecting the plane of said input, third and output axes.

4,392,392
ELECTRICALLY-OPERATED ROLLER DOOR OPERATING MECHANISM

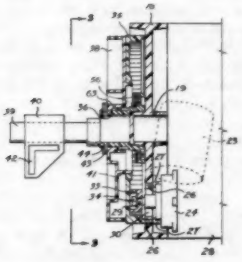
Milan Perisic, Woodforde; Warwick J. Lumbers, and John A. Bone, both of Holden Hill, all of Australia, assignors to Automatic Rollers Doors Australia Pty., Ltd., Adelaide, Australia

Filed Nov. 4, 1980, Ser. No. 203,902

Claims priority, application Australia, Nov. 8, 1979, PE1255

Int. Cl.³ F16H *35/00*; E06B *9/08*

U.S. Cl. 74—626 **14 Claims**



1. A driving mechanism for coiling a flexible curtain thereabout comprising:

(a) a transverse shaft;

(b) first and second drum wheels mounted for rotation about the axis of said shaft at axially spaced apart locations;

(c) a reversible electric motor fixedly mounted on the side of said first drum wheel facing said second drum wheel between the center and the rim of said drum wheel to bodily rotate about the axis of said shaft with rotation of said first drum wheel;

(d) a reduction gear mechanism affixed to and operatively associated with said motor with a drive shaft projecting through said first drum wheel at a location between the axis of said drum wheel and the rim of said drum wheel and terminating in a drive pinion positioned on the opposite side of said first drum wheel;

(e) a ring gear in meshing engagement with said pinion mounted adjacent said opposite side of said first drum wheel, said ring gear having its axis concentric with the axis of said shaft; and

(f) locking means to prevent rotation of said ring gear.

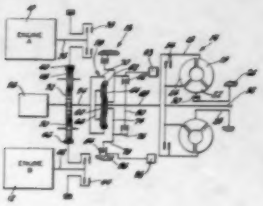
4,392,393
DUAL ENGINE DRIVE

Loren N. Montgomery, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1980, Ser. No. 211,634

Int. Cl.³ F16H *37/06*, *47/00*

U.S. Cl. 74—661 **4 Claims**



1. In a vehicle including a pair of synchronously operated engines each producing individual peak torque at substantially identical individual peak torque engine speeds, combining gear means between said pair of engines operative to combine the torque output of said pair of engines, said pair of engines producing combined engine peak torque at combined engine peak torque speed substantially equal to said individual peak torque engine speeds, and a torque converter the input torque absorption capacity of which at zero speed ratio and input speed substantially equal to said combined engine peak torque speed equals said combined engine peak torque, the combination comprising, selectively engageable direct drive means between said combining gear means and said torque converter operative to deliver to said torque converter combined engine torque at combined engine speed, selectively engageable reduction gear means between one engine of said pair of engines and said torque converter having a preselected gear ratio operative at a speed input equal to said individual peak torque engine speed and a torque input equal to said individual peak torque to reduce speed to a lower speed output whereat the corresponding higher torque output substantially equals the torque capacity of said torque converter at zero speed ratio when the torque converter input speed equals said lower output speed, and means operative to effect selective engagement of one said reduction gear means and said direct drive means.

4,392,394
ENGINE-GEAR ARRANGEMENT FOR VEHICLES, IN PARTICULAR PASSENGER CARS

Peter Hofbauer; Romanus Scholz; Paulus Heidemeyer, all of Wolfsburg, and Frank Zimmermann, Braunschweig, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,803

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944928

Int. Cl.³ F16H *37/08*

U.S. Cl. 74—689 **8 Claims**

1. A system for driving a motor vehicle with an infinitely variable belt gear comprising:

an engine transversely positioned to the longitudinal direction of said vehicle;

first and second drive cone pulleys for transmitting the rotational force of said engine;

clutch means for coupling said engine to said drive cone pulleys;

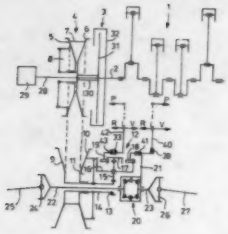
first and second output cone pulleys drivingly connected to said first and second drive cone pulleys;

a planetary gear drive with a sun gear, a ring gear, and a planetary gear carrier carrying planet gears, said sun gear being driven by said first and second output cone pulleys;

a differential gear coaxially positioned to said planetary gear

drive for driving the axles of said vehicle with a drive gear coupling said differential gear with said planetary gear drive;

a hollow shaft concentric with an output shaft of said differential gear drivingly disposed between said sun gear and said output cone pulleys;



first controllable clutch means for selectively engaging said drive gear and said ring gear or said drive gear and said planetary gear carrier;

a stationary housing; and

second controllable clutch means for selectively coupling said housing to said ring gear or said housing to said planetary gear carrier.

4,392,395

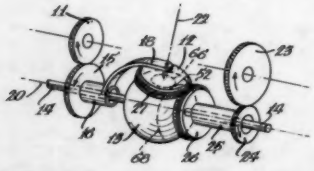
INFINITELY VARIABLE TRANSMISSION

John M. Clarke, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 19, 1981, Ser. No. 226,273

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—690 **18 Claims**



1. A device for transmitting power from a prime mover comprising:

first (16), second (25) and third (14) rotary power shafts;

a first fixed ratio gear pair (15,B) connecting said first rotary power shaft (16) to the prime mover;

a second fixed ratio gear pair (24,A) connecting said second rotary power shaft (25) to the prime mover;

means (12) for transmitting power to said third rotary power shaft (14) from said first (16) and second (25) rotary power shafts including means (18,54) for selectively transmitting power at either the speed of said first rotary power shaft (16) or the speed of said second rotary power shaft (25) and for infinitely varying the speed of said third rotary power shaft (14) to vary within a range bounded by the speeds of said first (16) and second (25) rotary power shafts; and

means for changing one of said engaged gear pairs (15,24) with a different ratio gear pair during zero torque conditions while said other engaged gear pair (24, 15) transmits power to said third power shaft (14).

4,392,396

FINAL DRIVE ASSEMBLY FOR VEHICLES

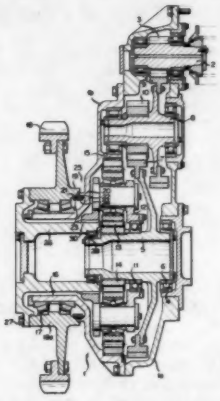
Yoshito Sato, Hirakata, and Tomoyuki Takahashi, Yawata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 8, 1980, Ser. No. 185,137

Claims priority, application Japan, Sep. 11, 1979, 54-124623[U]

Int. Cl.³ F16H *3/44, 1/28*

U.S. Cl. 74—785 **2 Claims**



1. A final drive assembly for a vehicle, comprising:

a housing;

an input pinion gear rotatably supported by said housing;

a hollow sun gear shaft rotatably supported by said housing, said hollow sun gear shaft having an open center portion;

a final drive gear fixedly mounted on said sun gear shaft;

an intermediate gear shaft having first and second intermediate gears mounted thereon, said first intermediate gear being in mesh with said input pinion gear and said second intermediate gear being in mesh with said final drive gear;

a planetary reduction gear group having a sun gear, a plurality of planet gears, a carrier and a ring gear, said sun gear being fixedly mounted on said sun gear shaft, said ring gear being radially and axially fixed to said housing, said planet gears being rotatably mounted on said carrier, said carrier being rotatably mounted on only said sun gear shaft, a bearing means mounted between said carrier and said hollow sun gear shaft restricting axial play and preventing radial play;

a sprocket rotatably mounted on said housing;

hollow torque tube means fixedly secured to said sprocket and rotatably mounted only on said sun gear shaft, said hollow torque tube means having a center portion open to said open center portion of said sun gear shaft; and

means for coupling said hollow torque tube means with said carrier in such a manner as to allow slight play in axial and circumferential direction therebetween.

4,392,397

METHOD OF PRODUCING A DRAWING DIE

Adrianus R. C. Engelfriet; Adriaan J. G. Op Het Veld, and Theodorus J. P. Van Vucht, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 19, 1980, Ser. No. 161,197

Claims priority, application Netherlands, Jun. 25, 1979, 7904922

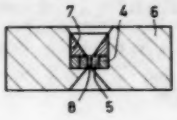
Int. Cl.³ B23P *15/24*; B21C *3/02*

U.S. Cl. 76—107 A **4 Claims**

1. A method of producing a wire-drawing die comprising the steps of:

providing a metal annulus having a bore; and

clamping a core directly in the bore of the annulus, said core consisting of a hard, wear-resistant material; characterized in that:



the annulus consists of a metal alloy which can be strengthened by a heat treatment; and

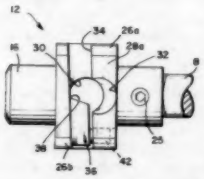
the method further comprises the step of increasing the ulitmate strength of the annulus by a heat treatment, while clamping the core therein.

4,392,398

WIRE TRIMMER

Jerzy Hoffman, 204 Washington Blvd., Santa Monica, Calif. 90406

Filed May 29, 1981, Ser. No. 268,401
Int. Cl.³ H02G *1/12*
U.S. Cl. 81—9.51 **4 Claims**



1. In a wire trimming machine having a motor and a rotatable shaft rotated by said motor, a trimmer comprising:

a cylindrical trunk with a first cylindrical bore in one end thereof coaxial with the longitudinal axis thereof, a second cylindrical bore in the other end thereof coaxial with said longitudinal axis and just large enough to receive said shaft, a transverse third cylindrical bore on one side of said trunk ending at said longitudinal axis, and a transverse fourth cylindrical bore on the opposite side of said trunk prallel to and eccentric of said third bore and ending at said longitudinal axis, said longitudinal axis being coplanar with the longitudinal axes of said transverse bores;

a pair of arcuate flange portions disposed centrally and circumferentially about said trunk and opposite each other, the ends of said flange portions terminating in parallel planes which are tangent to and which define opposite parallel sides of said trunk;

a slot in said one side of said trunk extending through both said arcuate flanges and from the circumference to the center of said trunk, said slot forming an acute angle with said longitudinal axis of said trunk; and

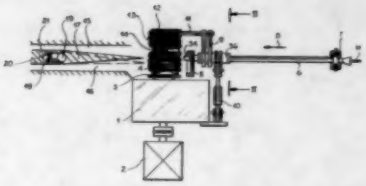
a cutting member disposed in one end of said slot and having a beveled cutting edge located at the inner termination of said first bore.

4,392,399

DRUM-TYPE WIRE SHEAR

Ewald Wyzgol; Hans-Jürgen Raschorn, and Gerhard Pechau, all of Magdeburg, German Democratic Rep., assignors to VEB Schwermaschinen-Kombinat "ERNST THALMANN" Magdeburg, Magdeburg, German Democratic Rep.

Filed May 21, 1981, Ser. No. 266,097
Int. Cl.³ B23D *25/12*
U.S. Cl. 83—106 **10 Claims**



1. An apparatus for cutting through a continuously longitudinally moving wire, said apparatus comprising:

a pair of cutter drums centered on and rotatable about respective generally parallel axes and having respective radially outwardly open generally helical wire grooves of substantially the same pitch but opposite hand, said drums being radially relatively closely spaced and defining a nip;

a guide element fixed rotationally on one of said drums and formed with a helical guide groove of the same hand and pitch and centered on the same axis as the respective wire groove but axially offset therefrom;

a cutter blade in at least one of said wire grooves adjacent one axial end thereof;

drive means for jointly and synchronously rotating said drums at substantially the same peripheral speed;

a swingable guide tube directed generally tangentially at said nip and having a downstream end closely juxtaposed with said drums at said nip, said wire passing through said tube;

a follower fixed to and at a fixed axial spacing from said downstream end and displaceable between an entrainment position engaging in said guide groove and an unengaged position out of said guide groove; and

means for displacing said follower into said entrainment position and simultaneously urging said guide tube attached thereto axially along said nip.

4,392,400

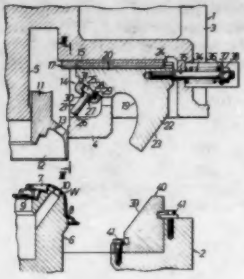
TRIMMING AND PIERCING APPARATUS

Masaru Sasagawa, Sayama; Tatsuo Umeda, Tokorozawa, and Mamoru Kushima, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 284,110
Claims priority, application Japan, Feb. 25, 1980, 55-23236
Int. Cl.³ B26F *1/40*
U.S. Cl. 83—185 **7 Claims**

1. A trimming and piercing apparatus comprising a fixed die provided with a work mounting surface and a piercing bore opened in said work mounting surface, a movable die displaceable toward and away from said fixed die, a pair of movable blades and a pair of fixed blades mounted in a spaced opposite relation on said movable die and said fixed die, respectively, so that said movable blades are engageable with said fixed blades when said movable die is moved toward said fixed die, a cam slide slidably mounted on said movable die, a piercing punch fixed to said cam slide, and a cam driver mounted on said fixed

die for driving said cam slide to move along said movable die toward said fixed die to place said piercing punch into fitting



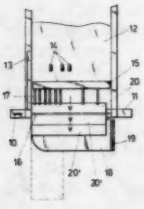
engagement with said piercing bore in said fixed die as said movable die is displaced toward said fixed die.

4,392,401

APPARATUS FOR STAGGERED CUTTING OF PLANAR WORKPIECES

Wilfried Ess, Schwarzach, Austria, assignor to Schelling & Co., Schwarzach, Austria

Filed May 20, 1981, Ser. No. 265,368
Claims priority, application Austria, May 21, 1980, 2725/80
Int. Cl.³ B27B *5/06*
U.S. Cl. 83—219 **4 Claims**



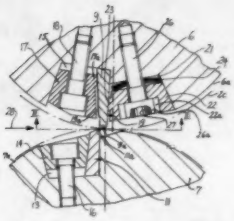
1. Apparatus for cutting planar workpieces comprising: saw means movable through a cutting stroke in a substantially horizontal direction; first table means on one side of said saw means; second table means on the opposite side of said saw means; adjustable alignment means for aligning on said first table means planar workpieces to be cut by said saw means; first feeding means including a plurality of individual clamping devices which are selectively operable to selectively individually engage planar workpieces on said first table means to feed said workpieces through a cutting operation relative to said means, with cut parts of said planar workpieces being thereby deposited on said second table means; pivot means on said second table means for turning said cut parts of said planar workpieces relative to said saw means; second feeding means for feeding said cut parts of said planar workpieces through said saw means with parts thereof being deposited back on said first table means; and roller means on said first table means including first roller devices operable to allow planar workpieces deposited thereon to move in one direction and second roller devices operable to allow planar workpieces deposited thereon to move in another direction transverse to said first direction; said first and said second roller devices being vertically displaceable relative to each other.

4,392,402

APPARATUS FOR SEVERING RUNNING PAPER WEBS OR THE LIKE

Harald Rann, Norderstedt, Fed. Rep. of Germany, assignor to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 144,029, Apr. 28, 1980, abandoned.
This application Dec. 21, 1981, Ser. No. 333,104
Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922164
Int. Cl.³ B26D *1/62*
U.S. Cl. 83—345 **12 Claims**



1. In an apparatus for subdividing at least one running paper web or the like into discrete sheets by severing the web during lengthwise transport along a predetermined path, the combination of a rotary holder disposed at one side of said path; a flexible knife having an inner portion and an elongated cutting edge remote from said inner portion, extending transversely of said path and arranged to sever the web once during each revolution of said holder; and means for adjustably securing said knife to said holder, including first retainer means recessed into said holder at one side of said knife and arranged to urge said inner portion of the knife against said holder, and second retainer means comprising a row of discrete retainers disposed at the other side of said knife, said row extending in substantial parallelism with the axis of said holder and each of said retainers being at least in linear contact with said other side of said knife, as considered in the axial direction of said holder, the neighboring retainers of said row being closely adjacent to each other and engaging said other side of the knife intermediate said inner portion and said cutting edge, said securing means further including means for moving said retainers relative to said knife and substantially radially of said holder to thereby move the loci of engagement between said retainers and said other side of the knife substantially radially of said holder with attendant flexing of the knife and resulting change in the position of said cutting edge with respect to said holder.

4,392,403

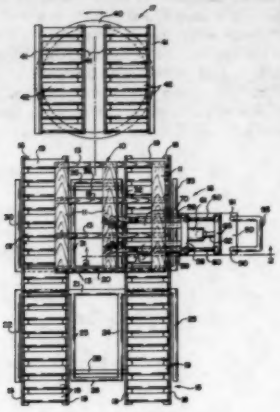
PORTABLE PALLET APPARATUS

Troy E. Martindale, Jr., Reynoldsburgh, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,615
Int. Cl.³ B23D *31/00*
U.S. Cl. 83—418 **6 Claims**

1. A portable pallet nail shearing apparatus having a support frame with wheels thereon for movement to a work area, a platform mounted above said support frame, power means interconnecting said platform to said support frame and operative to selectively raise or lower said platform relative to said support frame a predetermimed distance, guide means mounted between said platform and said support frame to maintain vertical alignment therebetween, support means mounted on said platform for movement therewith, said support means has a cross brace with a pair of guide sleeves mounted thereon, each of said sleeves having a guide rod slidably received therein, a pair of laterally spaced tool holders mounted on said support means for pivotal movement toward and away from each other along a horizontal plane, power operated means mounted on said support means and opera-

tively connected to said guide rods, said guide rods pivotably connected to said tool holders for pivoting said spaced tool holders upon actuation of said power actuating means, and



each tool holder having a plurality of cutting tools that are moveable into and out of intermeshing engagement for shearing operation.

4,392,404

CUTTING HEAD FOR GLASS CUTTING MACHINE

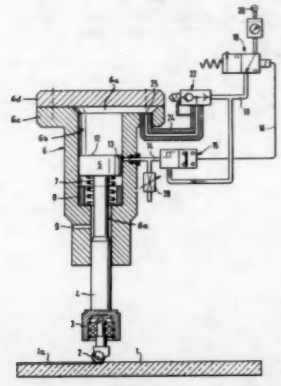
Norbert Schwarzenberg; Heinz Ueberwolf, both of Herzogenrath, and Jakob Kaesmacher, Stolberg-Buesbach, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, France

Filed Jan. 16, 1981, Ser. No. 225,783

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1980, 3002071

Int. Cl.³ C03B *33/02, 33/10*; B26D *3/08*

U.S. Cl. 83—886 **8 Claims**



1. A cutting head for use in a glass cutting machine comprising a cylinder, a piston adapted for movement in the cylinder in one direction in response to pressure from a source acting on an upper face, the movement of the piston being in opposition to means exerting a continuous force on the piston lower face tending to move the piston in the opposite direction, a rod connected at one end to the piston lower face, a cutting tool mounted on the rod at the other end to provide a cut in a glass blank along a prescribed path, means communicatingthe source of pressure to the cylinder for moving the piston in the one direction thereby to locate the cutting tool in a working position at a cutting plane, and means suppressing the pressure from the source acting on the pistion upper face and enabling rapid movement of the piston in the opposite direction under control of the force exerting means should the cutting tool move further in the one direction from the working position.

4,392,405

METHOD AND APPARATUS FOR PROCESSING TONE SIGNALS IN ELECTRONIC MUSICAL INSTRUMENTS

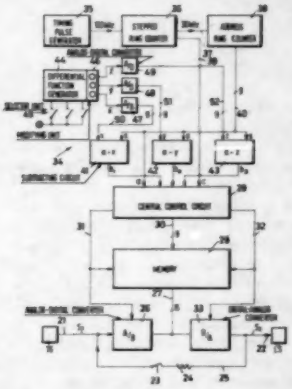
Reinhard Franz, Tulpenstrasse 15, D-5401 Emmelshausen, Fed. Rep. of Germany, and Wilfried Dittmar, Halsenbach, Fed. Rep. of Germany, assignors to Reinhard Franz, Emmelshausen, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 235,960

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006495

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.24 **16 Claims**



1. Apparatus for processing tone signals which are to be transmitted with a variable delay in an electronic musical instrument, especially in an electronic organ, comprising:

(a) means for supplying tone signals;

(b) a memory having input and output means and n storage locations;

(c) first transducer means for converting the amplitude of each supplied tone signal into digital values and for transmitting such values to said memory, said first transducer means being connected with said input means;

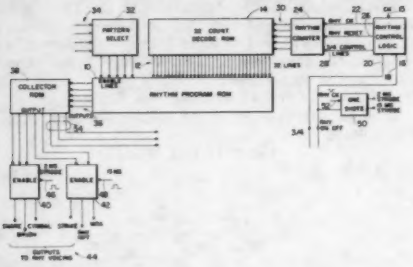
(d) addressing means including means for repeatedly counting to n, and means for effecting cyclical memorization of the digital values at locations which are selected in accordance with a first function, said effecting means comprising means for generating said first function, and said addressing means further including means for recovering digital values from said locations in accordance with at least one second function which differs from said first function in dependence on time, said recovering means comprising means for generating said second function, and said second function generating means including means for deriving said second function from said first function, said second function generating means also including means for generating an analog function, and transducer means for converting said analog function into a digital function; and

(e) additional transducer means for converting the digital values recovered by said recovering means into analog values and for consolidating such analog values into processed tone signals, said additional transducer means being connected with said output means.

4,392,406
SWITCHED CAPACITOR SINE WAVE GENERATOR AND KEYER

Gary R. Fritz, Ferdinand, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Jun. 22, 1981, Ser. No. 275,984
Int. Cl.³ G10H 1/02
U.S. Cl. 84—1.26 33 Claims



1. In an electronic musical instrument, a waveform and envelope generation circuit comprising:

means for producing a keying signal for calling forth a desired musical waveform, said keying signal comprising a DC voltage level,

envelope generator means responsive to said keying signal for producing on an output an envelope waveform, said envelope generator means having an input connected to said keying signal and an output and charge pump means for incrementally transferring the DC voltage level on said input to said output as a plurality of increasing or decreasing discrete amplitude levels under the control of a first clocking signal connected to said envelope generator means, said charge pump means including a charge storing means for accumulating discrete units of charge to produce said discrete amplitude levels,

tone generator means having an input operatively connected to the envelope generator means output and responsive to the envelope waveform for producing on a further output a cyclic musical waveform having an envelope following the envelope waveform, said tone generator means comprising second charge pump means for repetitively and incrementally generating a complete cycle of the musical waveform under the control of a second clocking signal wherein each cycle of the musical waveform has an amplitude determined by the envelope waveform said second charge pump means including a charge storing means for accumulating discrete units of charge to produce time sequential discrete amplitude levels that together form a cycle of said waveform.

4,392,407
MACHINE GUN AMMUNITION LOADING SYSTEM

Clifford E. LaFever, Mission Viejo, and John H. Peck, Fountain Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 27, 1981, Ser. No. 296,737
Int. Cl.³ F41D 10/14
U.S. Cl. 89—33 BB 6 Claims

1. A machine gun ammunition loading system comprising:

a machine gun having a loading position and a charging position;

a magazine for containing belted rounds including a leading round;

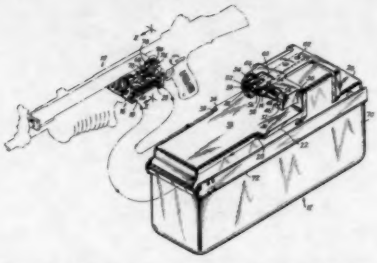
mating means on said magazine and said machine gun for sliding engagement of said magazine with said machine gun;

a receiver in said machine gun;

cantilevered means on said magazine for holding and positioning said leading round, which includes;

a first cantilevered means for guiding a nose portion of said leading round and a second cantilevered means for guiding a butt portion of said leading round;

a resilient hold down means engaging said leading round and operative to resist displacement thereof from its position in said first and second cantilevered means;



said cantilevered means and said leading round being inserted to said loading position by said sliding engagement;

a feed pawl movable between first and second positions in said receiver;

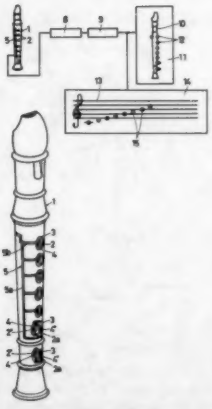
said feed pawl in its first position being engageable with said leading round in its loading position; and

said feed pawl being operative when moving from its first to its second position to displace said leading round from its loading position to its charging position.

4,392,408
RECORDER TRAINING DEVICE

Manji Suzuki, 443, Ryoke-machi, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Jun. 24, 1981, Ser. No. 276,823
Claims priority, application Japan, Jul. 1, 1980, 55-89630
Int. Cl.³ G10D 7/00
U.S. Cl. 84—380 C 3 Claims



1. A musical recorder training device comprising:

a recorder body having a plurality of tone-controlling openings;

a plurality of electrode pairs, the electrodes of each electrode pair being disposed on opposite sides of a respective

tone-controlling opening such that closure of a tone-controlling opening with a finger tip provides an electric current path between a respective electrode pair through that finger tip, the electrodes in each pair being positively fixed relative to one another;

a plurality of terminals, at least one terminal being provided for each electrode pair and at least one additional terminal;

a plurality of metal conductors secured substantially along their entire lengths to said recorder body, each conductor extending between a respective terminal and one electrode in a respective electrode pair;

a further metal conductor secured substantially along its entire length to said recorder body, said further conductor extending between said additional terminal and the other electrodes of said electrode pairs;

a plurality of electric lamps; and

circuit means connecting each of said electric lamps to a respective terminal of said plurality of terminals for selectively energizing each lamp as a function of the open and closed condition of each tone-controlling opening, respectively;

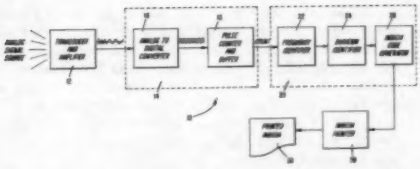
wherein said tone-controlling openings are circular holes and wherein each electrode extends arcuately and substantially concentrically about a portion of respective tone-controlling openings.

4,392,409

SYSTEM FOR TRANSCRIBING ANALOG SIGNALS, PARTICULARLY MUSICAL NOTES, HAVING CHARACTERISTIC FREQUENCIES AND DURATIONS INTO CORRESPONDING VISIBLE INDICIA

Peter Coad, Jr., La Habra, Calif., and David E. Wilensky, Emporia, Kans., assignors to The Way International, New Knoxville, Ohio

Filed Dec. 7, 1979, Ser. No. 101,102
Int. Cl.³ G01D *9/40*; G09B *15/02*; G10G *3/04*
U.S. Cl. 84—462 **27 Claims**



1. A system for translating a series of analog signals having characteristic frequencies and durations into written indicia representing said signals, said system comprising:

means for converting said analog signals into a corresponding series of electrical signals having corresponding characteristic frequencies and durations;

means for generating a series of digital signals corresponding to said electrical signals, said series of digital signals reflecting the characteristic frequencies of said corresponding analog signals and for counting the number of digital signals occuring in said latter series during successive time intervals of predetermined length to produce counts having values corresponding to the frequencies and durations of said analog signals;

means for producing a series of indicia codes from the counts produced by said generating and counting means, said series of indicia codes corresponding to said series of digital signals, each of said indicia codes also representing both the frequency and the duration of a corresponding one of said analog signals; and

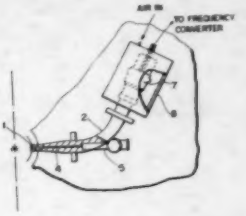
means for printing indicia representing said indicia codes on a record medium, said printing indicia identifying both the frequency and the duration of corresponding ones of said analog signals.

4,392,410

ULTRASONIC LOADING OF EXTRUDABLE PLASTIC BONDED EXPLOSIVES

Robert R. Durrell, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1981, Ser. No. 279,644
Int. Cl.³ C06B *21/00*
U.S. Cl. 86—1 R **9 Claims**



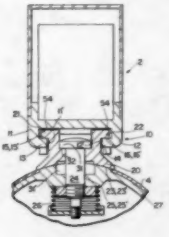
1. A method for loading extrudable plastic bonded explosives into long small diameter orifices contained in a warhead initiation system comprising pressurizing the loading system with an inert gas at pressures in the range of 1000 to 2000 psi and providing ultrasonic vibrations on the loading system in the range of from 20K H_z to 30K H_z.

4,392,411

LAUNCH FOR CARRYING AND LAUNCHING FLYING BODIES, IN PARTICULAR FOR AIRCRAFT

Bernd Minkler, Oberteuringen, Fed. Rep. of Germany, assignor to Dornier GmbH, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,618
Int. Cl.³ F41F *7/00*
U.S. Cl. 89—1.819 **5 Claims**



1. In a launch for carrying and launching flying bodies, in particular for aircraft, with guide devices in the form of guide rails and guide claws engaging said rails and bearing the flying body,

the improvement comprising

(a) means whereby the guide claws can be adjusted together with the flying body relative to the aircraft-fixed launch in the direction of flight within the guide rails and also relative to the flying body they carry in the direction of the flying body tail,

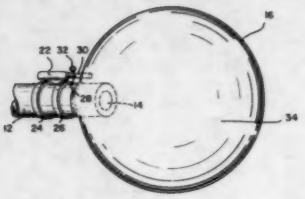
(b) detachable, positive connection means and frictional connection means between the guide claws and the flying body, and

(c) braking means for the guide claws at the launch.

4,392,412
GASEOUS BLAST REDUCER

Edward M. Schmidt, Forest Hill, and George D. Kahl, Aberdeen, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1980, Ser. No. 202,220
Int. Cl.³ F41F *17/12*
U.S. Cl. 89—14 D 5 Claims

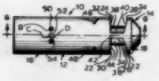


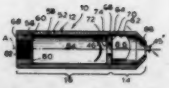
1. Apparatus for reducing blast from an explosive source which includes:
a gun barrel having a muzzle;
means for supplying a gas, which includes a pressurized container containing said gas;
means for containing said gas in the vicinity of said source whereby the blast is forced to propagate through said gas before reaching ambient air which includes:
an inflatable membrane; and
means for securing said inflatable membrane over said muzzle; and
means for releasing said gas into said means for containing.

4,392,413
MUZZLE ATTACHMENT FOR A FIREARM BARREL

Mack W. Gwinn, Jr., Levant, Me., assignor to Firepower, Inc., Hancock, Me.

Filed Jan. 2, 1981, Ser. No. 222,148
Int. Cl.³ F41C *21/18*
U.S. Cl. 89—14 C 1 Claim



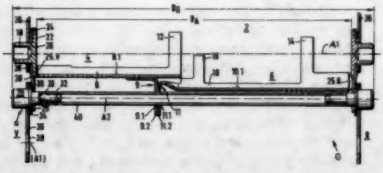


1. A muzzle attachment for a firearm having a barrel with a muzzle end portion, comprising:
a tubular member;
baffle means disposed within said tubular member for defining a first large rearwardly disposed chamber and a second smaller forwardly disposed chamber;
aperture means defined within the upper wall portion of said first large chamber within a rearward region thereof and within the vicinity of the vertical axial plane of said tubular member for venting the gases of said firearm from said first large chamber in a vertically upwardly and outwardly mode as a result of each bore of each aperture intersecting the longitudinal axis of said tubular member whereby a downwardly directed reaction is impressed upon said muzzle attachment and said firearm so as to arrest the natural climb of said firearm and muzzle attachment when said firearm is fired;
the forwardmost end of said tubular member having a substantially truncated conical configuration;
aperture means defined within the central axial and peripheral portions of said baffle means for providing fluidic communication between said first large chamber and said second smaller chamber, the annular portion of said baffle means defined between said central and peripheral aperture means serving as means for interfering with the flow of gases from said first large chamber to said second smaller chamber and thereby provide a reaction surface for said gases whereby a forward force for counteracting the natural recoil of said firearm is impressed upon said firearm and muzzle attachment, said peripheral gas flow from said first chamber to said second chamber impinging upon said truncated surfaces of said forwardmost end of said tubular muzzle attachment whereby said truncated surfaces also serve as reaction means for said gases whereby an additional forward force for counteracting said natural recoil of said firearm is impressed upon said muzzle attachment and said firearm;
rib means defined within the upper and lower wall surfaces of said tubular member defining said second forwardly disposed chamber for defining slot means within the sidewalls of said tubular member attachment such that the net venting effect of said gases from said forward chamber is upwardly and outwardly whereby a net downwardly directed reaction force is impressed upon said muzzle attachment and said firearm so as to arrest the natural climb of said firearm and said muzzle attachment when said firearm is fired; and
forwardly and outwardly directed slot means defined within the downstream end of said first larger chamber sidewall portions for venting said gases from said first larger chamber so as to intercept said gases vented from said second smaller chamber through said sidewall slot means and causing all of said gases to flow forwardly away from the muzzle end portion of said firearm barrel and thereby substantially reduce the noise level perceived by the person firing said firearm.

4,392,414
AMMUNITION BELT

Richard Koine, Ratingen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 4, 1981, Ser. No. 231,410
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005256
Int. Cl.³ F42B *39/08*
U.S. Cl. 89—35 R 2 Claims



1. An improved ammunition belt for automatic barrel weapons, in particular machine cannons, wherein the belt comprises

a plurality of belt members each of which is adapted to accommodate an ammunition unit therein and which includes flexible retention means mounted on the belt for maintaining the ammunition units in operative position thereon and which includes means for interaction with the ammunition belt feed means of the automatic barrel weapon, the improvement comprising

(a) each belt member comprises ammunition holding means for detachably holding an ammunition unit in operative position in said belt member; and at least one strap pivotally connected to the ammunition holding means by means of a first pivotal connection;

(b) each of said straps having an opening passing therethrough which is spaced from the first pivotal connection between said strap and said holding means;

(c) the means for interaction with the ammunition belt feed means being disposed on said ammunition holding means and at the first pivotal connection connecting the holding means and the strap;

(d) the opening in said strap is adapted to form part of a second pivotal connection connecting said strap and the ammunition holding means of the next following belt member, said second pivotal connection also forming part of said means for interaction with the ammunition belt feed means;

(e) a pair of straps is pivotally connected to opposite ends of said ammunition holding means to form said first pivotal connection; said means for interaction with the ammunition belt feed means being formed by pin-like projections at said second pivotal connection on said holding means and said first pivotal connection; and

(f) said opening has an arcuate configuration the center of curvature of which coincides with the axis of the first pivotal connection.

4,392,415
CONTROL FOR DEAD ENGINE LOWER

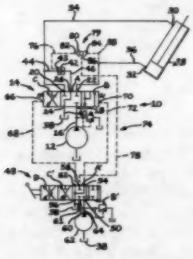
Kurt B. Melocik, Mazon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01704, § 371 Date Dec. 19, 1980, § 102(e) Date Dec. 19, 1980, PCT Pub. No. WO82/02230, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 19, 1980, Ser. No. 273,889

Int. Cl.³ F16K *31/122*

U.S. Cl. 91—461 **2 Claims**



1. In a fluid system (10) having a fluid source (12), a tank (38), an actuator (28) having a first end (30) and a second load supporting end (32); a pilot operated control valve (14) having first and second ends (66,70) and being connected to said source (12) and said actuator (28); a source of pilot fluid (62); a pilot control valve (48) connected to said source of pilot fluid (62) and said first and second ends (66,70) of the pilot operated control valve (14) and movable between at least one operating position and a float position; a make-up valve (42) connected between the first end (30) of the actuator (28) and the main control valve (14), a vent line (74) connected to the make-up valve (42) and the pilot control valve (48) and being in communication with the tank (38) at the float position (D) of the pilot control valve (62); the improvement comprising:

means (79) for communicating the second load supporting end (32) of the actuator (28) to the tank (38) only through said vent line (74) and said pilot control valve (48) in response to loss of said source of pilot fluid (62) and said pilot control valve (48) being moved to said float position (D) so that the second load supporting end (32) can be vented to the tank (38) at a controlled rate regardless of the pressure of the fluid in the second load supporting end.

4,392,416
SWASH-PLATE TYPE COMPRESSOR HAVING LOW NOISE THRUST BEARINGS

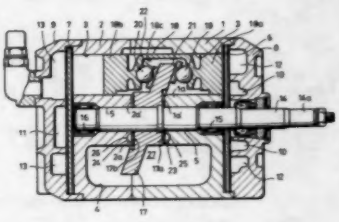
Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1981, Ser. No. 258,008

Claims priority, application Japan, May 10, 1980, 55-61935

Int. Cl.³ F04B *1/16, 1/18*

U.S. Cl. 92—71 **10 Claims**



1. In a swash-plate type compressor including: a pair of cylinder blocks combined together in axial alignment, said combined cylinder blocks each having an axial hole extending along an axis thereof and a plurality of cylinder bores axially extending therethrough in circumferentially spaced relation; a drive shaft inserted in said axial holes of said cylinder blocks; a plurality of pistons slidably received within respective ones of said cylinder bores; and a swash plate engaging with said pistons and rigidly fitted at a boss thereof on said drive shaft, said boss having opposite end faces, each of said opposite end faces being substantially flat and extending substantially straight and substantially radially of said drive shaft over a substantially whole area thereof, said combined cylinder blocks having a pair of central seating portions facing opposite said end faces of said boss of said swash plate, said central seating portions having end faces facing said end faces of said boss, each of said end faces of said central seating portions being substantially flat and extending substantially straight and substantially radially of said drive shaft over a substantially whole area thereof, said axial holes of said cylinder blocks opening in end faces of respective ones of said central seating portions facing said swash plate;

the improvement comprising a pair of thrust bearings arranged at opposite ends of said swash plate for supporting thrust loads caused by said swash plate, said pair of thrust bearings each comprising:

a plurality of seats, each seat being in the form of a blind hole, said seats being formed in the substantially flat end face of a corresponding one of said central seating portions and arranged around a corresponding one of said axial holes and in circumferentially spaced relation; and

a plurality of bearing members corresponding in number to said seats, said bearing members each having no fluid passage formed therein and each having one end portion thereof slidably fitted in a corresponding one of said seats;

said seats each having a hole shape corresponding to the shape of said one end portion of a corresponding one of said bearing members for receiving a corresponding one of said bearing members therein;

said bearing members each having another formed with an end face being substantially planar over a substantially whole area thereof such that said substantially planar end faces of said another ends of said bearing members have no recess formed therein, said bearing members each having said substantially planar end face thereof disposed in slidable contact with an associated end face of said boss of said swash plate along a substantially whole area thereof; and

said end faces of said boss of said swash plate being slightly spaced by said bearing members from said opposite end faces of said central seating portions of said combined cylinder blocks.

4,392,417

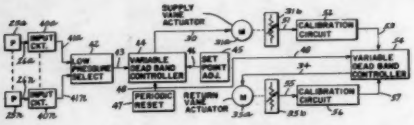
VARIABLE DEAD BAND PRESSURE CONTROL SYSTEM

James R. Johannsen, Minnetonka, Minn., assignor to McQuay-Perfex Inc., Minneapolis, Minn.

Division of Ser. No. 34,869, Apr. 30, 1979, Pat. No. 4,257,318. This application Aug. 18, 1980, Ser. No. 179,016

Int. Cl.³ B64D *13/00*

U.S. Cl. 98—1.5 **3 Claims**



1. A control system for controlling the return air blower of an air distribution system including a supply blower which may operate at varying air flow rates, for maintaining proper relative airflow of the return blower in response to the airflow of the supply blower, comprising:

means responsive to the supply air flow for producing a signal indicative thereof;

means responsive to the return air flow for producing a signal indicative thereof;

actuator means operatively connected for controlling the air flow of said return blower;

comparison means operatively connected to provide control signals to said actuator in response to received supply and return air flow signals, to control return air flow to follow supply air flow;

calibration means connecting said supply air flow signal and said return air flow signal to said comparison means, said calibration means including adjustable means for independent adjustment of high and low air flow rate settings of said actuator corresponding to high and low air flow settings of said supply blower; and

said comparison means including a variable dead band controller for providing said control signals to said actuator when the calibrated supply and return air flow signals applied thereto differ by more than a predetermined dead band, and including means for narrowing the dead band to rebalance the system according to the supply air flow and for widening the dead band to prevent excessive system hunting or oscillation.

4,392,418

COOKING APPARATUS

James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Continuation-in-part of Ser. No. 619,837, Oct. 6, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,400

Int. Cl.³ A47J *27/04*

U.S. Cl. 99—330 **14 Claims**

1. An apparatus for cooking food products comprising:

(a) a vessel for containing a homogeneous mass comprising the product to be cooked immersed in a liquid;

(b) pump means for circulating the liquid throughout said vessel, in a manner so as to gently agitate said homogeneous mass without the need for mechanical agitation means;

(c) steam injector means disposed within said vessel for injecting steam interiorly thereof to uniformly raise the temperature of the homogeneous mass, said means being fixedly disposed intermediate the homogeneous mass and comprising:

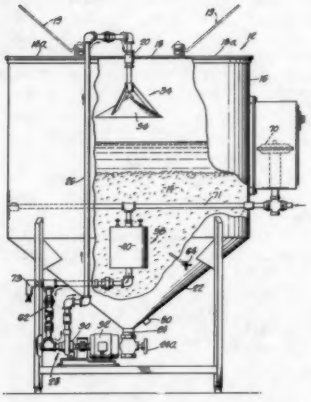
(1) a steam chamber having a steam inlet and side walls provided with a plurality of steam outlet passages arranged to eject steam outwardly in a direction toward the homogeneous mass; and

(2) steam deflection means disposed within said steam chamber proximate said steam inlet for deflecting steam toward the outlet passages provided in said side walls; and

(d) sensor means cooperatively associated with said steam injector means for sensing the temperature of the homogeneous mass and stopping the flow of steam into said vessel when a predetermined temperature is reached.

9. An apparatus for cooking food products comprising:

(a) a vessel for containing a homogeneous mass comprising the product to be cooked immersed in a liquid;



(b) pump means for circulating the liquid throughout said vessel to gently agitate said homogeneous mass without the necessity for mechanical agitation means;

(c) a hollow housing disposed within said vessel;

(d) a steam chamber fixedly mounted within said hollow housing centrally of said homogeneous mass, said steam chamber having a steam inlet and side walls provided with a plurality of steam outlet passageways;

(e) means disposed within said steam chamber for deflecting steam through said steam outlet passageways to uniformly heat the liquid comprising a part of said homogeneous mass; and

(f) means for sensing the temperature of the homogeneous mass and stopping the flow of steam to said steam inlet of said steam chamber when a predetermined temperature is reached.

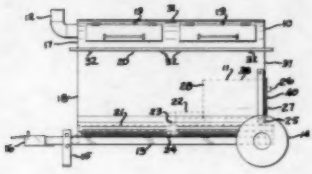
12. The apparatus as defined in claim 9 including means disposed with said hollow housing for removably covering a portion of the outlet passageways formed in said steam chamber.

4,392,419

COOKING AND SMOKING APPARATUS

Weldon D. Bonny, R.D. 1, Dalton, Pa. 18414

Filed Mar. 25, 1980, Ser. No. 133,795
Int. Cl.³ A47J 37/04
U.S. Cl. 99—339 14 Claims



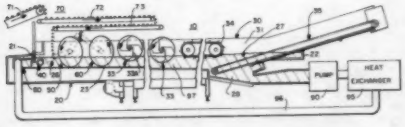
1. A cooking and smoking apparatus comprising a housing enclosing a cooking and smoking space and having an upper portion and a lower portion, a perforated shelf inside said housing in said upper portion for supporting goods to be cooked or smoked, a first opening in said upper portion of said housing for the egress of smoke therefrom, a second opening in said lower portion of said housing, a fire box including an enclosed drawer selectively slideable in and out of said second opening and having a transverse cross section substantially complemental to said second opening, said drawer having a flat horizontal uninterrupted top surface defining an uninterrupted planar cover completely covering said drawer for closing the top of said drawer and providing a cooking surface, an openable and closeable front access door for said drawer, a damper means in communication with the interior of said firebox for controlling the size and intensity of the fire therein, and an exit passageway through said drawer remote from said front access door and said top surface to conduct heat and smoke from the interior of said firebox into the interior of said housing even while said drawer is partially moved outwardly of said second opening of said lower portion of said housing, said planar cover serving as a second cooking means when said drawer is moved to any of its outward positions.

4,392,420

RECIRCULATING HOT OIL COOKING APPARATUS

Andrew A. Caridis, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat & Control, Inc., So. San Francisco, Calif.

Continuation of Ser. No. 222,744, Jan. 5, 1981, abandoned. This application Mar. 1, 1982, Ser. No. 353,337
Int. Cl.³ A47J 37/12
U.S. Cl. 99—406 19 Claims



1. In a recirculating hot oil cooking assembly for animal and vegetable product pieces,

an elongated pan assembly having front, rear, bottom, and side walls for containing a volume of hot oil flowing between a product entry zone located near said front wall and adapted to receive said product pieces in raw form and a product exit zone located near said rear wall and adapted to discharge said product pieces after cooking;

a sump formed in the bottom of said pan near said product exit zone for withdrawing oil from said pan assembly;

an inlet header assembly for supplying hot oil to said pan assembly at said product entry zone including an inlet feed jet extending substantially across said front wall of said pan assembly underneath the surface of said volume of oil to supply a substantially uniform stream of oil at a substantial velocity across a surface region of said product entry zone;

a pump and heat exchanger assembly coupled between said sump and said inlet header for recirculating reheated oil therebetween to establish said flowing volume of hot oil in said pan assembly; and

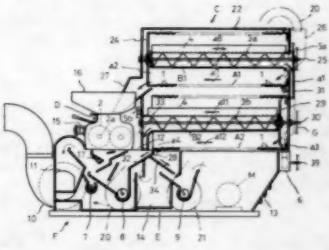
flow directing means mounted adjacent said product entry zone of said pan assembly for repetitively altering the localized flow direction of said volume of hot oil to reduce recirculating eddy currents in said oil in said product entry zone, said flow directing means comprising a plurality of fin means positioned at spaced preselected non-normal orientations behind the product entry zone and movable so as to achieve said repetitively alternating localized flow of said hot oil while reducing eddy currents in said oil, said flow directing means additionally including means to repetetively move said fins for such purpose, whereby improved movement of said product pieces away from said product entry zone towards said product exit zone is produced to reduce clumping of raw product pieces in said product entry zone.

4,392,421

RICE HULLING AND SORTING DEVICE

Noriyuki Yano, Kochi; Satoru Yahashi, Nangoku; Kanzo Shimazaki, Nangoku; Mitsuaki Nakazawa, Nangoku, and Takashi Yamamoto, Nangoku, all of Japan, assignors to Seirei Industry Company Limited, Okayama and Yanma Agricultural Equipment Company Limited, Osaki, both of, Japan

Filed Mar. 27, 1981, Ser. No. 248,453
Claims priority, application Japan, Mar. 27, 1980, 55-121472; Mar. 27, 1980, 55-39975; Mar. 27, 1980, 55-39976; Mar. 27, 1980, 55-41023; Mar. 27, 1980, 55-41025; Mar. 27, 1980, 55-41026; Mar. 27, 1980, 55-41032
Int. Cl.³ B02B 3/04, 7/02
U.S. Cl. 99—524 8 Claims



7. In a rice hulling and sorting machine, the combination including:

horizontally disposed sorting cylinder means arranged for rotation about its longitudinal axis;

fixed trough means extending generally horizontally along the length of the interior of said sorting cylinder means;

the interior surface of said sorting cylinder means being provided with a multitude of generally radially inwardly facing recesses, each of said recesses being of a size to temporarily trap therein a single grain of unpolished rice when disposed in a lower portion of its circumferential path of movement and to discharge said trapped grain of rice into said trough means when disposed in an upper portion of said movement;

said trough means including an adjusting plate extending in the longitudinal direction of the trough means and upwardly from one side thereof, the lower margin of said

plate being pivotally mounted for adjusting the angle of inclination of the plate.

4,392,422

APPARATUS FOR REMOVING LIQUID FROM A SUSPENSION

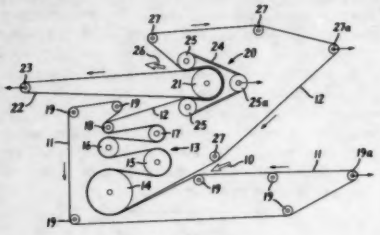
Sven Hakansson, Västerhaninge, Sweden, assignor to Axel Johnson Engineering AB, Nynaeshamn, Sweden

Filed Jun. 22, 1981, Ser. No. 275,994

Claims priority, application Sweden, Jun. 25, 1980, 8004701

Int. Cl.³ B30B 9/24

U.S. Cl. 100—118 **5 Claims**



1. Apparatus for removing liquid from a suspension comprising a pair of continuous webs movable over a portion of their length along a common path having an upstream end for introducing the suspension between the webs, a first pressing section including at least a first press drum about a portion of which the pair of webs pass, a second pressing section located downstream from the first pressing section and comprising a second press drum and pressure means for applying pressure to the outer web relative to the second press drum, outlet means located downstream from the second pressing section for removing a relative dried suspension material, and means for separating one of the pair of webs from the other web of the pair downstream of the first pressure section and prior to the second pressure section, the other web of the pair passing as the outer web to carry the suspension material around a portion of the second press drum to the outlet means.

4,392,423

PRINTING HAMMER DRIVING APPARATUS

Isao Nakajima, Iwamamachi; Koji Tagusari; Kenji Okuna, both of Shimoinayoshi; Toru Hayama, Kashiwa; Kazue Takahashi, Shimoinayoshi; Michihiro Watanabe, Shimoinayoshi, and Sumihisa Kotani, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 7,982, Jan. 1, 1979, abandoned. This application May 27, 1980, Ser. No. 153,318

Claims priority, application Japan, Feb. 8, 1978, 53-12398; Mar. 29, 1978, 53-35481

Int. Cl.³ B41J 9/02

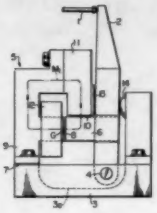
U.S. Cl. 101—93.48 **2 Claims**

1. A printing hammer driving apparatus capable of high speed printing, comprising:

a lever member made of a light-weight non-magnetic material, said lever member having a base end used as a rotational supporting point and another end thereof used as a push rod operating part to drive a printing hammer,

an armature mounted to project from an intermediate part of said lever member in a direction of rotation of said lever member about said supporting point, and

an electromagnet including at least a core and an exciting coil wound on said core, said core of said electromagnet having at least two magnetic pole faces which are opposed to said armature with gaps therebetween, wherein for a given ratio of a distance (L) from the rotational supporting point of said lever member to said armature to a distance (r_2) from said rotational supporting point to a contact point at which said lever member acts as the push rod operating part, said armature is mounted on said lever



member having the distance r_2 to said operating part at a position corresponding to said distance (L) so that the equivalent mass of said lever member with said armature mounted thereto is minimized.

4,392,424

BELT PRINTING MECHANISM HAVING IMPROVED CATCH MECHANISM FOR DETENTING POSITIONING WHEEL

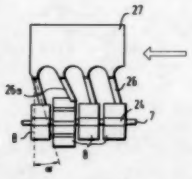
Kurt Schrotz, Hirschhorn, and Richard Schwöbel, Rothenberg, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,222

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034923

Int. Cl.³ B41J 1/60

U.S. Cl. 101—111 **5 Claims**

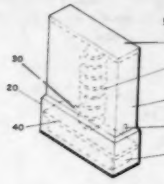


1. In a belt printing mechanism having a plurality of parallel continuous type belts which on their exterior surface carry print types and which extend around an adjusting wheel and a plurality of respective star wheels where the star wheels are rotatable about a shaft and where each star wheel has four corners, and spring tongues for preventing free rotation of the star wheels which are held under tension against the star wheels to hold the latter in predetermined detent positions where the spring tongues touch at least two separated points of the perimeter located between two adjacent corners of the star wheels, the improvement wherein for each star wheel only one spring-tongue is provided whose plane with respect to the plane in which its associated star wheel rotates about the shaft is an acute angle.

4,392,425
RETRACTABLE INK STAMP

John P. Capezzuto, Cambridge, and Lewis H. Johnson, Mansfield, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 13, 1981, Ser. No. 253,992
Int. Cl.³ B41K 1/50, 1/56
U.S. Cl. 101—327 9 Claims



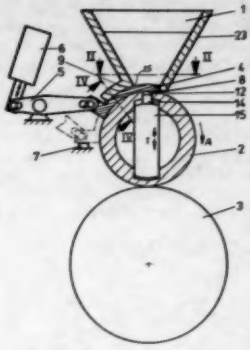
1. A retractable ink stamp comprising:
a handle,
an ink stamp housing slideably mounted to one end of the handle, and
a retractable ink stamp assembly located substantially within the ink stamp housing, said ink stamp assembly comprising an ink stamp matrix having a thickness in a range between about ¼ inch to 1 inch and a total volume of at least 0.06 cubic inches, said stamp matrix constructed of a nonelastomeric polymer foam having an open cell structure, an average pore diameter of between about 36 to 44 microns and a pore volume of about 25 to 45 percent of the total matrix volume, the polymer foam selected from the group consisting of polyethylene, polypropylene, polyvinylchloride and polyvinyl/fluoride, and means for self-retracting the ink stamp matrix, said means comprised of a member having at least one fold circumferentially within its surface to produce a bellows effect within the member as the handle is depressed, said means interconnecting the stamp matrix and said handle so that as the handle is depressed, the housing and handle slide towards each other causing a minor portion of the matrix to extend beyond the open end of said ink stamp housing, and as said handle is released, said self-retracting means causes the ink matrix to withdraw into the interior of the stamp housing.

4,392,426
INK-APPLYING ARRANGEMENT

Regina Wege, Leipzig, German Democratic Rep., assignor to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Mar. 30, 1981, Ser. No. 249,176
Claims priority, application German Democratic Rep., Apr. 15, 1980, 220444
Int. Cl.³ B41F 31/04, 31/06, 31/08
U.S. Cl. 101—363 13 Claims

1. An ink-applying device, particularly for a printing machine, comprising a funnel-shaped ink reservoir having at least one opening through which ink is discharged and including a wall formed with a doctor blade in the region of said opening, a rotary pick-up roller positioned in the proximity of said opening to receive ink therefrom, said pick-up roller including at least one longitudinally extending row of ink dosing chambers formed in a circumferential surface thereof; and movable means, said movable means including a plurality of sliding members adapted to slide along said circumferential surface towards and from said doctor blade to close or open communication between said at least one opening and at least some of

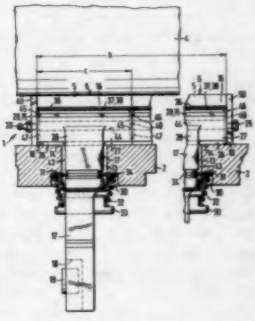


said chambers to provide a required dosing of ink received by said roller.

4,392,427
INK FOUNTAIN FOR PRINTING MACHINES

Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer AG, Würzburg, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,849
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033996
Int. Cl.³ B41F 31/04; B41L 27/06
U.S. Cl. 101—365 1 Claim



1. An ink fountain for use in printing machines, said ink fountain comprising:
an ink fountain roller plunging into said ink fountain;
a plurality of individually operable ink metering elements pivotably positioned laterally side by side in a longitudinal gap in an ink fountain bottom portion of said ink fountain, each of said ink metering elements being provided with a pivotable arm which passes through a vertical opening in said longitudinal gap;
a flat, elastic sealing strip rigidly secured to, and leakproofly connected with, rear parts of all of said ink metering elements and a tail surface of said ink fountain;
an elastic sealing cord extending along the length of all said ink metering elements and being disposed between a left guiding surface of said longitudinal gap and vertical surfaces of said ink metering elements immediately facing said left guiding surface; and
elastic sealing membranes sealingly engaging each of said pivotable arms and said bottom about each of said vertical

openings, said elastic sealing strip, said elastic sealing cord, and said elastic sealing membranes cooperating with said longitudinal gap to define a sealed, lubricant filled chamber, said ink metering elements, with the exception of ink guiding surfaces having ink metering extensions which project into the ink fountain, being completely disposed in said sealed, lubricant filled chamber.

4,392,428

INK FOUNTAIN FOR PRINTING MACHINES

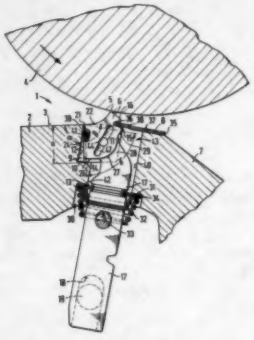
Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer AG, Würzburg, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,852

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033997

Int. Cl.³ B41F *31/04*; B41L *27/06*

U.S. Cl. 101—365 **4 Claims**



1. An ink fountain for use in printing machines, said ink fountain comprising: an ink fountain roller plunging into said ink fountain; a plurality of ink metering elements provided laterally side by side in an ink fountain bottom of said ink fountain to form an adjustable ink metering slot in cooperation with a peripheral surface of said ink fountain roller; said ink fountain bottom having a longitudinal gap which is axially parallel to said ink fountain roller and having a parallelogram-shaped cross section, a base surface of said longitudinal gap extending parallel to a bottom surface of said ink fountain bottom, a left guiding surface of said gap and said bottom surface forming at their abutting edge a common pivoting edge for said ink metering elements and enclosing an angle less than or equal to 90°; and a right guiding surface in said longitudinal gap; each of said ink metering elements being individually operable, being rigidly secured to a pivotable arm and being capable of pivoting around said pivoting edge; and wherein portions of the periphery of said ink metering elements which are disposed in said longitudinal gap are in contact with said guiding surfaces.

4,392,429

MULTIPLICATIVE ADJUSTMENT PROVISION AT AN INK FEED REMOTE CONTROL DEVICE

Karl-Heinz Förster, Dresden, and Hans Johne, Radebeul, both of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Dec. 7, 1981, Ser. No. 328,091

Claims priority, application German Democratic Rep., Dec. 12, 1980, 226000

Int. Cl.³ B41F *31/04*

U.S. Cl. 101—365 **2 Claims**

1. A multiplicative adjustment provision at an ink feed remote control device with a servo system actuating doctor blade support elements, comprising a servo system including

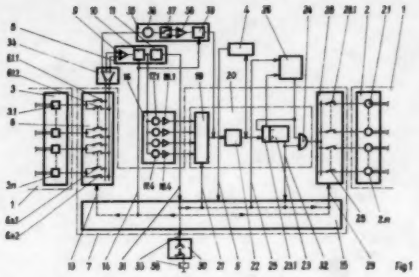
a set point providing section;

a control system connected to the servo system and provided at its inputs and outputs with multiplexers including

a servo drive;

a motor control circuit;

a process control unit coordinating with the right sequence the motor control unit successively on the input and output side to the servo system;



a first computing circuit preceding the motor control unit;

a difference forming unit having input and output connected to the process control unit and having its output connected to the first computing circuit;

a switching means connected to the difference forming unit and connected to an input multiplexer of the control system; and

a second computing circuit connected to the motor control unit and to the switching means.

4,392,430

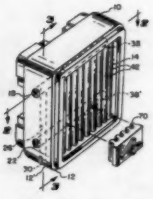
BASE-LOCK TYPE FONT HOLDER FOR IMPRINTING APPARATUS

Burton L. Siegal, Skokie, Ill., assignor to Kiwi Coders Corporation, Wheeling, Ill.

Filed Jul. 21, 1981, Ser. No. 285,445

Int. Cl.³ B41F *27/00*

U.S. Cl. 101—381 **19 Claims**



1. A base-lock type-font holder for use with an imprinting device comprising a body having an outwardly opening cavity of generally rectangular configuration and a peripheral rim surrounding said cavity, a plurality of base-lock segments each having at least a pair of transverse passages and arranged in parallel rows within said cavity with said passages thereof aligned coaxially, said rows of segments defining parallel type-font holding grooves, a pair of spaced passageways formed in each of a pair of opposite portions of said peripheral rim, screw means engaged through said passageways and passages of said segments, said screw means having a head portion at one end, said head portion being of a configuration defining opposite side surfaces, means carried by said screw means for clamping

said segments tightly upon rotation of said screw means in one direction for securing the type-font within said holding grooves and in the opposite direction for releasing same, a connecting bore formed in one of said rim portions communicating between said adjacent passageways and resilient means within said connecting bore in bearing relationship with a facing side surface of said head portion of said screw means with force sufficient to bias said screw means against non-manipulated rotation particularly in said opposite direction.

4,392,431

METHOD TO MAINTAIN SMOOTH RUNNING OF INK METERING ELEMENTS IN INK FOUNTAINS OF PRINTING MACHINES

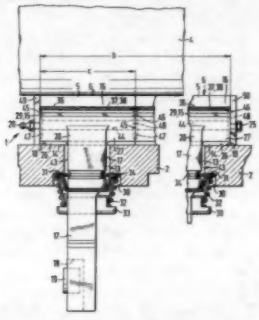
Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer AG, Würzburg, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,848

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033995

Int. Cl.³ B41F *31/04*; B41L *27/06*

U.S. Cl. 101—426 **4 Claims**



1. A method of maintaining smooth running of individually adjustable ink metering elements of an ink fountain having an ink fountain roller in a printing machine wherein a plurality of said ink metering elements are disposed laterally side by side in a row in a bottom portion of said ink fountain parallel to an axis of rotation of said ink fountain roller, said method comprising the steps of: supplying a lubricant through a longitudinal borehole formed in each said ink metering element; and

pressing said lubricant from said longitudinal borehole in each said metering element into the space between front sides of immediately adjacent ones of said ink metering elements whereby ink and dirt particles are excluded from said spaces between adjacent ones of said ink metering elements thereby maintaining smooth running of said elements.

4,392,432

AIR BURST MUNITIONS SIMULATOR

Walter J. Fenrick; Robert H. Chesney, and Paul A. Mast, all of Medicine Hat, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Feb. 28, 1980, Ser. No. 125,630

Claims priority, application Canada, Jul. 19, 1979, 331921

Int. Cl.³ F42B *13/44*

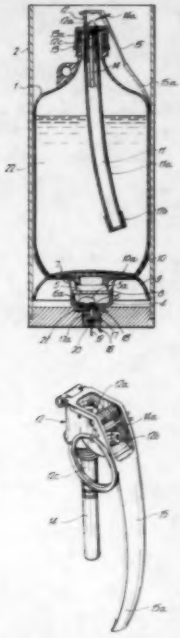
U.S. Cl. 102—334 **5 Claims**

1. An air-burst munitions simulator for disseminating a readily dispersable substance in air, comprising

(a) payload container means of a suitable frangible plastics material adapted to contain a readily dispersable substance, said payload container means including a convex obturator which when positioned in a barrel of a launcher defines a confined airspace to collect a cushion of gases resulting from the burning of said propellant charge, to push the simulator into the air,

(b) propellant charge means attached to said container to propel said container into the air,

(c) ignition means for igniting said propellant charge,



(d) burster charge means disposed within said container to shatter said frangible container to disseminate said readily dispersable substance in air, and

(e) detonating means associated with said burster charge means for detonating said burster charge.

4,392,433

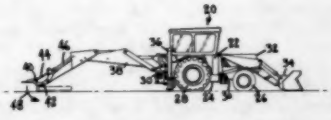
RAILWAY MAINTENANCE MACHINE

Clifford A. Nyland, Prior Lake, Minn., assignor to Railroad Service, Inc., Lakeville, Minn.

Filed Aug. 7, 1980, Ser. No. 176,016

Int. Cl.³ E01B *29/10*

U.S. Cl. 104—9 **5 Claims**



1. A device for removing old railroad ties from beneath an elevated length of track and inserting new ties in place of those removed, comprising:

(a) a working member including

(i) a removing arm having first and second ends and a plurality of tie engagement elements at said second end, said removing arm disposed for movement generally about said first end; and

(ii) an inserting arm having first and second ends and a tie

lifting lip mounted at said second end of said inserting arm generally perpendicular thereto, said inserting arm fixed relative to said removing arm and spaced angularly therefrom for movement generally about its said first end; and

(b) means for imparting rotational movement to said working member with said arms moving generally about their said first ends.

4,392,434

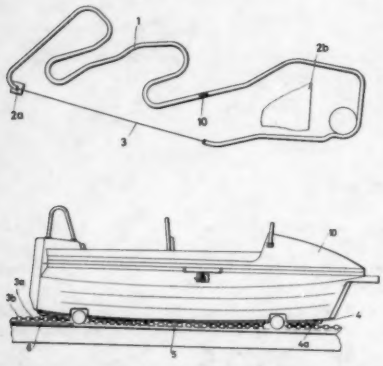
TURBULENT WATERWAY

Dierk Dürwald, and Karl-Ernst Kaufmann, both of Wetter, Fed. Rep. of Germany, assignors to Mannesmann Demag AG, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,192

Int. Cl.³ A63G *21/18*; B65G *17/06*

U.S. Cl. 104—70 5 Claims



1. In a turbulent waterway having boats guided in a water trough extending between an uphill starting point and a downhill terminus water basin,

(a) a chain conveyor means having a series of links extending on a slope between said starting point and said terminus water basin and adapted to travel upwardly therebetween, said chain conveyor means being substantially comprised of alternating vertically and horizontally oriented chain links, each of which has rounded edges;

(b) the underside of said boats being provided along their length with at least one lengthwise extending locking bar means with transverse grooves adapted to mesh with the horizontally oriented chain links of said chain conveyor;

(c) said chain conveyor means, when moving at a selected speed, serving to initially, upon contact between said chain conveyor means and said locking bar means, pull said boat at a speed less than said selected speed until said boat accelerates to said selected speed whereupon said chain conveyor means meshes with said locking bar means; and

(d) sliding support means for supporting said chain links for sliding therealong, said sliding support means having a vertically oriented groove for guiding said vertically oriented chain links such that said horizontally oriented chain links mesh with said transverse grooves of said locking bar means.

4,392,435

TRANSPORT APPARATUS

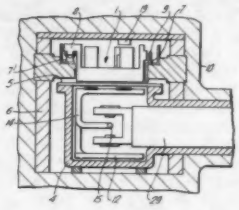
Brian R. Moody, Darwen; Duncan B. Lowe, Mobberley, and Derek W. Lowe, Southport, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 24, 1980, Ser. No. 171,723

Claims priority, application United Kingdom, Aug. 3, 1979, 7927231

Int. Cl.³ B61B *13/08, 13/10*

U.S. Cl. 104—284 5 Claims



1. An apparatus for transporting toxic or radioactive articles comprising an enclosed passageway defining a path of travel for the articles, at least one work station positioned along and communicating with said passageway intermediate its ends, a movable drive unit located outside the passageway, a juxtaposed slave unit within the passageway forming a carrier for an article movable in unison with the drive unit, electromagnet means on the drive unit to couple the drive unit to the slave unit for movement, control means for maintaining the slave unit magnetically suspended within the passageway and at a desired position relative to the drive unit upon energization of the electromagnet means, a barrier of magnetically transparent material extending along the passageway and positioned between the drive unit and the slave unit to physically isolate the drive unit from the slave unit and to protect the drive unit from contamination within the passageway arising from the toxic or radioactive articles whereby to permit ready access to the drive unit for maintenance and the like operations.

4,392,436

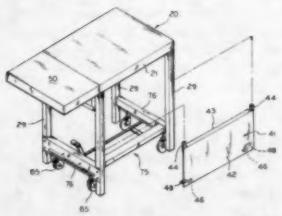
KNOCKDOWN METAL TABLE

Raywood C. Weiler, Fontana, Calif., assignor to BMC Products, Chicago, Ill.

Filed Nov. 17, 1980, Ser. No. 207,295

Int. Cl.³ A47B *1/04, 13/18, 91/00*

U.S. Cl. 108—81 8 Claims



1. In combination a generally rectangular table and an auxiliary component removably attached thereto, said table including a horizontal member having depending flanges forming a plurality of corners, and a plurality of legs each being defined by four sides with adjacent sides being perpendicular so that said legs are generally square shaped in cross section, a diagonal connecting member at each of said corners, each of said diagonal connecting members having threaded means, a screw

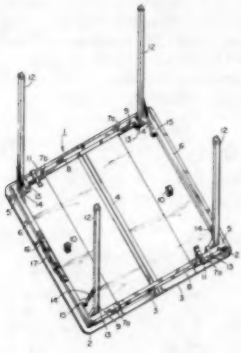
member received in each of said threaded means, said screw members being adjustable relative to said legs, a U-shaped member diagonally positioned and engaged by each of said screw members with spaced sides of each of said U-shaped members engaging the innermost right angle corner of one of said legs and adapted to apply pressure against said leg to hold said leg in one of said corners formed by said depending flanges, said screw members when retracted permitting removal of said legs, said auxiliary component including a pair of spaced attaching means each having a flat portion with each such portion being adapted to be received between a corresponding one of said legs and flanges before the screw member is adjusted to secure said leg to one of said corners formed by said depending flanges.

4,392,437

FOLDABLE TABLE WITH FOLDABLE SUPPORT FRAME

John D. Wallace, 18 Cranbury Neck Rd., Cranbury, N.J. 08512

Filed Jan. 21, 1981, Ser. No. 226,880
Int. Cl.³ A47B 3/00
U.S. Cl. 108—112 **8 Claims**



1. A foldable assembly comprising:

first and second substantially planar and rectangular panels each having respective first and second short sides and respective first and second long sides;

means for foldably joining said first and second panels so that said panels may be selectively placed in a folded configuration or in an unfolded configuration in which their planes are substantially coplanar;

said means for foldably joining said first and second panels joining said panels so that said second long side of said first panel is joined to said first long side of said second panel, said first short sides are in substantial alignment and said second short sides are in substantial alignment;

a first subassembly attached to said first panel proximate said first long side hereof;

a second subassembly attached to said second panel proximate said second long side hereof;

said first subassembly having first and second channel portions each with a generally C-shaped cross-section proximate said first and second short sides, respectively, of said first panel;

said second subassembly having first and second channel portions each with a generally C-shaped cross-section proximate said first and second short sides, respectively, of said second panel;

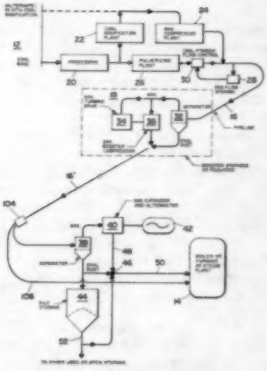
first and second bar members each having first and second ends; means for pivotably attaching said first end of said first bar member within said first C-shaped channel portion of said first subassembly so that said first bar member may be rotated in a plane substantially parallel to said plane of said first panel from a storage position when said panels are in said folded configuration to a support position in which said second end of said first bar member is received within said first C-shaped channel portion of said second assembly so that said first bar member spans between said first and second subassemblies when said panels are in said unfolded configuration; and means for pivotably attaching said first end of said second bar member within said second C-shaped channel portion of one of said first and second subassemblies so that said second bar member may be rotated in a plane substantially parallel to said plane of the respective one of said first and second panels from a storage position when said panels are in said folded configuration to a support position in which said second end of said second bar member is received within said second C-shaped channel portion of the other one of said first and second subassemblies so that said second bar member spans between said first and second subassemblies when said panels are in said unfolded configuration.

4,392,438

COAL TRANSPORT SYSTEM

James L. Dooley, Santa Monica, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Jun. 22, 1981, Ser. No. 275,911
Int. Cl.³ F23K 3/02
U.S. Cl. 110—106 R **13 Claims**



1. An economical system for transporting coal from a first location where coal is abundant and inexpensive to a utilization point, as a non-explosive particulate suspension in gas comprising:

means for forming coal gas from coal at said first location;

means for pulverizing coal into very fine particles at said first location;

an extended length conduit more than one mile in length extending from said first location to said utilization point;

means for compressing said coal gas at said first location;

means for supplying said coal particles and the pressurized coal gas to said conduit with the coal particles suspended in said coal gas to form a non-explosive two phase system;

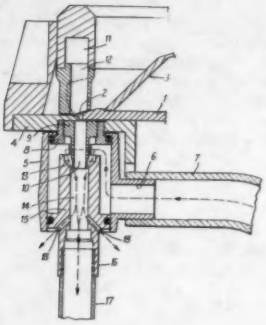
means for collecting and utilizing both said coal particles and said coal gas at the other end of said extended conduit; and

means for maintaining said coal particles in suspension in said coal gas as the suspension passes through the conduit, said means for maintaining said coal particles in suspension including means for rotating the suspension as it passes along the length of said conduit comprising vanes mounted within said conduit and oriented at an angle with respect to the longitudinal axis of said conduit.

4,392,439
PNEUMATIC TRANSPORT DEVICE PARTICULARLY FOR SINGLE-SEED SEED DRILL

Paul Herriau, Cambrai, France, assignor to Societe SOGEFINA, Societe de Gestion Financiere Armoricaine, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,365
Claims priority, application France, Mar. 31, 1980, 80 07190
Int. Cl.³ A01C *7/04, 7/20*
U.S. Cl. 111—34 **2 Claims**

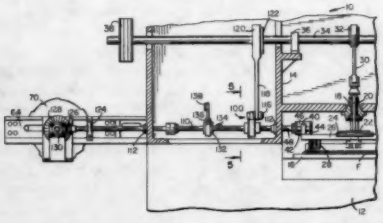


1. In a pneumatic transport apparatus particularly for single-seed drills, comprising an inlet tube (**10**) into which the seeds are introduced one by one, an annular passage (**13**) of convergent form for air under pressure about the end of the inlet tube (**10**) and a tubular passage (**14**) whose one end communicates with said annular passage and whose other end is connected to a pneumatic transport tube (**17**); the improvement comprising downstream and at a small distance from the neck of the annular passage (**13**) of convergent form, a plurality of openings (**18**) communicating between the tubular passage (**14**) and the atmosphere and diverging downstream at an acute angle from the axis of said tubular passage (**14**), the total cross-sectional area of said openings (**18**) corresponding to about ¼ to ½ of the cross-sectional area of said tubular passage (**14**), whereby the pressure is decreased downstream from said openings (**18**).

4,392,440
MULTI-STITCH CAM NEEDLE BAR SHIFTER FOR TUFTING MACHINES

Gary L. Ingram, Ooltewah, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Apr. 13, 1981, Ser. No. 253,800
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 A **10 Claims**

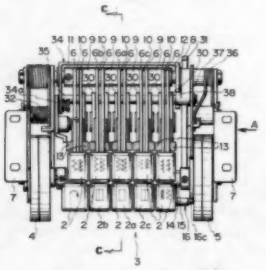


1. In a tufting machine having a reciprocating needle bar carrying a plurality of needles spaced transversely across the machine and adapted to penetrate a base material moving longitudinally across a support plate thereof to insert a plurality of stitches upon each penetration of the base material, mounting means for mounting said needle bar for transverse movement relatively to the base material, a rotatably mounted cam having stitch pattern information for directing the movement of the needle bar, follower means responsive to the stitch pattern information on said cam, means connecting said follower means to said needle bar for selectively shifting said needle bar transversely in accordance with the stitch pattern information on said cam, and cam drive means for rotatably driving said cam, said cam drive means comprising an index drive having input means continuously driveable through a repetitive cycle and output means driven by the input means during only an index portion of the cycle of the input means and being stationary during the remainder of the cycle of the input means, means for driving said input means in time relationship with the reciprocation of the needle bar such that said input means and said needle bar have a common cycle, and means operatively connecting said output means to said cam for rotatably driving said cam intermittently to stop the rotation of said cam at least during a portion of the time the needles are within the base material.

4,392,441
SEWING MACHINE WITH BUTTONHOLE STITCHING MECHANISM

Yasukata Eguchi, Kunitachi, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 249,664
Claims priority, application Japan, Mar. 31, 1980, 55-41583[U]
Int. Cl.³ D05B *3/06*
U.S. Cl. 112—158 B **3 Claims**



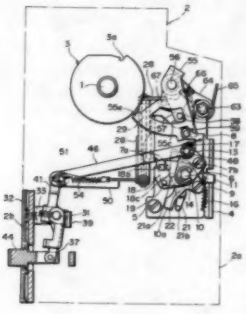
1. In a sewing machine having a machine housing and a stitch-producing arrangement mounted on the machine housing and including a feeding device operative for selectively feeding the material to be sewn in a selected one of two opposite feeding directions, a needle reciprocable through the material being sewn and swingable transversely of the feeding directions, and a drive operatively connectable to the feeding device and to the needle and operative for operating the same, a stitch pattern control arrangement comprising, in combination, a plurality of pattern cams mounted on said machine housing for rotation about an axis; means for rotating said pattern cams in dependence on the operation of said drive; a pattern selecting device including a plurality of operator-controlled pattern selecting elements mounted on said machine housing for movement between operative and inoperative positions, and a plurality of cam followers operatively connected to the respective pattern selecting elements to engage the respectively associated pattern cams in said operative position, and disengage the same from said pattern cams in the inoperative position, of the respective pattern selecting element; means for holding said pattern selecting elements in said operative positions until released; feed adjusting means operatively connected to said feeding device and operative for changing the feeding direction and for discontinuing the feed-

ing operation of the feeding device in dependence on which of said pattern selecting elements is in said operative position thereof; and operator-controlled needle-swing amplitude adjusting means movable from a first to a second predetermined position and operative for displacing said needle to a predetermined position and for causing said holding means to release the respective pattern selecting element then held thereby for return to said inoperative position thereof during such movement, said amplitude adjusting means including a cam movable between said first and second predetermined positions, and a control arm tracing said cam and operatively connected to said needle to displace the same into said predetermined position thereof during said movement of said cam from said first to said second predetermined position thereof.

4,392,442
SEWING MACHINE WITH A CYCLIC PATTERN STITCHING DEVICE

Yasuro Sano, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1981, Ser. No. 230,593
Claims priority, application Japan, Feb. 6, 1980, 55/12812
Int. Cl.³ D05B *69/22, 3/02*
U.S. Cl. 112—275 **1 Claim**

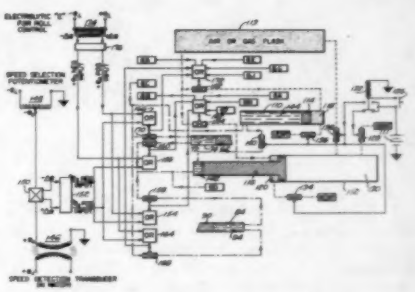


1. A sewing machine, comprising an upper drive shaft (1) rotated to vertically reciprocate a needle to penetrate a fabric to be sewn for producing stitches thereon; a machine drive motor energized by operation of a microswitch (26) to rotate the upper drive shaft; a stop cam (3) secured to the upper drive shaft for rotation therewith: a blocking element (55) movable between an inoperative position in which the blocking element (55) is located out of the rotation path of the stop cam (3) and an operative position in which the blocking element (55) is located in the rotation path of the stop cam (3) to block the latter; a clutch mechanism normally connecting the upper drive shaft (1) to the machine drive motor and being operated to disconnect the upper drive shaft from the machine drive motor when the blocking element blocks the rotation of the stopper cam; a plurality of pattern cams rotated by the upper drive shaft (1) at a predetermined speed and being selectively connected to the needle to control the lateral movement thereof; cycle stitch control cam means (60) rotated by the upper drive shaft (1) at the same speed with the pattern cams; control means (64) cooperating with the cycle stitch control cam means (60) and moved by the latter between a first position for maintaining the blocking element (55) in the inoperative position and a second position for displacing the blocking element into the operative position at a predetermined angular position of the cycle stitch control cam means (60), said control means (64) including actuating means (57) which is moved in association with the control means and is movable between an inoperative position in which said actuating means (57) disconnects said control means (60) from the blocking means (55) and an operative position in which said actuating means (57) connects said control means to the blocking means (55); operating means (42, 35, 41, 50, 28) manually operated to move the actuating means (57) between the inoperative position and the operative position; switch operating means (39, 46, 13, 11, 18, 7) operated in association with the operating means to turn on the microswitch (26) when said actuating means (57) is moved to the operative position by the operating means; and releasing means (8, 10, 21) operated in association with the blocking element (55), when the blocking element blocks the rotation of the stop cam (3), to release said switch operating means (7) to thereby turn off the microswitch (26).

4,392,443
ELECTRO-PNEUMATIC HYDRAULIC CONTROL SYSTEMS

Michael De Marco, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,404
Int. Cl.³ F42B *19/01*; B63H *1/14*
U.S. Cl. 114—20 R **9 Claims**



1. A speed control system comprising:

speed detection transducer means (146) for converting the velocity of water flowing through said speed detection transducer means to a corresponding DC voltage;

a speed selection potentiometer (148) for providing a reference DC voltage;

comparator means (150 and 152) for receiving said corresponding DC voltage and said reference DC voltage, said comparator means having two output terminals for providing an error signal to a selected one of said two output terminals, said selected one being determined by the comparative magnitude of said corresponding DC voltage and said reference DC voltage;

first (160) and second (158) valves connected to be operated if said reference DC voltage should be larger in magnitude than said corresponding DC voltage;

third (170) and fourth (168) valves connected to be operated if said corresponding DC voltage should be larger in magnitude than said reference DC voltage;

first (62) and second (90) pistons hydraulically connected to said respective first (160) and second (158) valves and said first (62) and second (90) pistons hydraulically connected to said respective third (170) and fourth (168) valves;

negative hydraulic pressure means connected to said first (160) and second (158) valves for providing negative pressure to said first (62) and second (90) pistons upon operation of said respective first (160) and second (158) valves;

positive hydraulic pressure means connected to said third (170) and fourth (168) valves for providing positive hydraulic pressure to said first (62) and second (90) pistons upon operation of said respective third (170) and fourth (168) valves; and

first and second impeller rotation means connected respectively to said first (62) and second (90) pistons for being

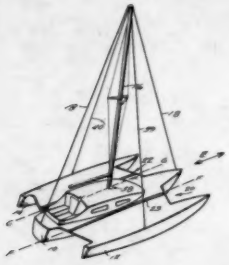
rotated at an increase speed in unison upon negative hydraulic pressure being applied to said first (62) and second (90) pistons, and for being rotated at a decreased speed in unison upon positive hydraulic pressure being applied to said first (62) and second (90) pistons.

4,392,444

HIGH STABILITY TRIMARAN

Lars G. Andersson, Lufttrycksgatan 3 BV, S-417 40 Goteborg, Sweden

Filed Jan. 6, 1981, Ser. No. 222,877
Claims priority, application Sweden, Jan. 10, 1980, 7906031
Int. Cl.³ B63H *35/00*
U.S. Cl. 114—39 **10 Claims**



1. A trimaran comprising: an elongated main hull, a starboard hull, and a port hull, the starboard and port hulls disposed on opposite sides of said main hull and parallel thereto; a mast; stays extending between said mast and said main hull for stabilizing the position of said mast with respect to said main hull; and means for operatively attaching said starboard and port hull to said main hull, for operatively attaching said mast to said main hull, and for operatively attaching said mast to said starboard and port hulls, so that the angle of inclination of said main hull is minimized and so that the trimaran is self-righting; said means for operatively attaching said starboard and port hulls to said main hull comprising means for pivotally mounting each of said starboard and port hulls to said main hull along a side of said main hull so that said starboard and port hulls are pivotal about an axis generally parallel to the direction of elongation of said main hull; said means for operatively attaching said mast to said main hull comprising means for pivotally mounting said mast to said main hull so that it is pivotal about an axis substantially parallel to the axes about which said starboard and port hulls are pivotal; and said means for operatively attaching said mast to said starboard and port hulls comprising shroud means.

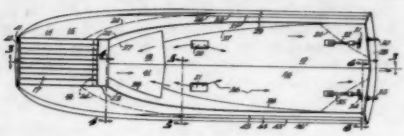
4,392,445

FLEXIBLE BOW AIR RIDE BOAT HULL

Donald E. Burg, Miami, Fla., assignor to Paulette Renee Burg; Sheri Renee Burg; Daniel Earl Burg and Nicole Renee Burg, all of Miami, Fla., part interest to each

Continuation-in-part of Ser. No. 207,789, Nov. 17, 1980, abandoned, Ser. No. 69,771, Aug. 27, 1979, abandoned, Ser. No. 818,303, Jul. 25, 1977, Pat. No. 4,165,703, and Ser. No. 737,403, Nov. 1, 1976, abandoned. This application Jun. 3, 1981, Ser. No. 269,908
Int. Cl.³ B63B *1/38*
U.S. Cl. 114—67 A **20 Claims**

1. In an improved boat hull that is partially supported by a pressurized gas lifting surface including a recess in an underside of the hull, which recess is supplied with pressurized gas from at least one powered gas supply source through at least one gas inlet connected to said recess, and having a gas sealing forward flexible member which is supplied with gas from at least one gas inlet, the improvement comprising:

stabilizing, load-carrying catamaran-like sidehulls beginning at a forward portion of and extending downward from the hull and having keels extending substantially parallel to each other rearwardly from said forward portion of said hull to a point at which they begin to diverge, said gas

sealing forward flexible member extending between and substantially to said point of divergence of said substantially parallel portions of said side hull keels; and

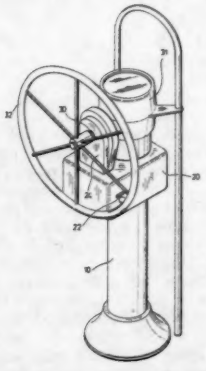
at least one fixed substantially rigid aft gas sealing bow member extending over a major portion of recess width, said bow member including at least one surface in part curvilinear and at least partially comprising at least one inverted V structure.

4,392,446

PEDESTAL MOUNT AUTOPILOT

Gerardus H. Vander Eyken, Longbranch, and James J. Thoman, Mississauga, both of Canada, assignors to Cinkel Industries, Ltd., Mississauga, Canada

Filed Apr. 6, 1981, Ser. No. 251,464
Int. Cl.³ B63H *25/04*
U.S. Cl. 114—144 R **17 Claims**

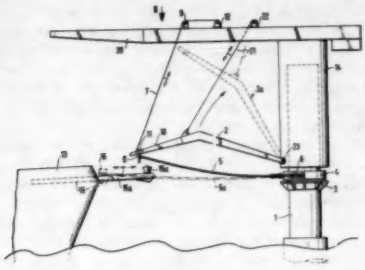


1. An electromechanical arrangement for use in an autopilot for yachts comprising a directional indicator, positionable sensing means associated with said directional indicator for determining movement thereof relative to said sensing means, electrical drive means controlled by said sensing means including an electrical motor and a transmission, said electrical drive means providing the input for said transmission with the output of said transmission connected to a mechanical drive means for engaging the steering system of such yacht and means associated with said sensing means and said mechanical drive means for moving said sensing means relative to said directional indicator in response to movement of said mechanical drive means, and clutch means to allow selective engagement and disengagement of said electrical motor from such steering system, wherein said means associated with said sensing means is in constant communication with such steering system.

4,392,447
OFFSHORE MOORING SYSTEM

Hermann Kaps, Bremen, Fed. Rep. of Germany, assignor to Howaldtwerke - Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel and LGA Gastechnik GmbH, Remagen, both of, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,333
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031717
Int. Cl.³ B63B *21/20*
U.S. Cl. 114—230 10 Claims



1. An offshore mooring system for seagoing vessels comprising in combination:

(a) an offshore tower comprising a turnable tower head at its upper end above the waterline and a jib on the tower head,

(b) a mooring hawser of predetermined length both ends of said mooring hawser being fastened to a collar means capable of rotary movement around the upper end of the offshore tower, said mooring hawser being suspended beneath the jib,

(c) a mooring bitt on the forecastle of a vessel which is to be moored,

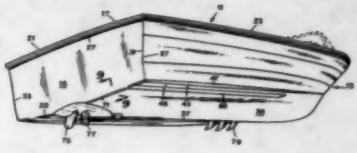
(d) mechanical means for automatically spreading open and holding said mooring hawser open to form a wide loop above the height of the bitt of the vessel when the vessel has approached the tower, and for lowering the spread open loop of said mooring hawser over the bitt thereby capturing the bitt by the loop, wherein said mechanical means for spreading open and holding the mooring hawser comprises spreader blocks for retaining the mooring hawser and for spreading it open to a loop, said spreader blocks being movable by spreader lines connected to the spreader blocks, said system including means to wind and unwind said spreader lines.

4,392,448
SKI BOAT

Robert L. Shirley, Maryville, Tenn., assignor to Master Craft Boat Company, Maryville, Tenn.

Continuation-in-part of Ser. No. 13,618, Feb. 21, 1979, Pat. No. 4,263,866, which is a continuation of Ser. No. 824,968, Aug. 15, 1977, abandoned. This application Jul. 25, 1980, Ser. No. 172,159
The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.
Int. Cl.³ B63B *1/18*
U.S. Cl. 114—271 10 Claims

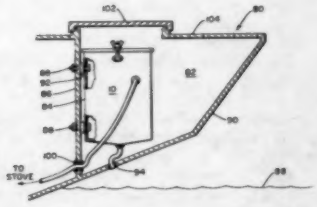
1. A ski boat for producing a relatively small, well-defined wake and a relatively smooth working table, comprising an elongated hull having a keel section generally V-shaped in cross section, the angle of the "V" increasing towards the stern of the hull, a chine panel at each of the outboard edges of said keel section, said chine panels extending from a forward portion of the hull to the stern, each of said chine panels defining an acute angle with the horizontal towards the forward end of the boat which angle decreases to provide a chine panel which is generally horizontal at the stern, a transom at the stern of the hull, said transom being bowed outwardly, an orienting panel of narrow width following the line of said transom, said orienting panel inclining downwardly from said V-shaped keel section and chine panels to said transom, and a pair of secondary chines mounted upon said keel section, each of said secondary chines being located on opposing sides of said V-shaped keel section and being parallel to the centerline of said V-shaped keel section and following the contour of said keel section.



4,392,449
BELOW DECK ENCLOSURE FOR PRESSURIZED, HEAVIER THAN AIR GAS

Bruce F. Dining, R.F.D. #1, Exeter, N.H. 03833

Filed May 1, 1981, Ser. No. 259,564
Int. Cl.³ B63B *11/00*
U.S. Cl. 114—343 4 Claims



1. An enclosure for volatile or flammable heavier than air gases stored as fluids under pressure in canisters on a marine vessel comprising:

a sealable housing having an opening on one side thereof;

a removable lid covering the opening of said housing;

means cooperating with said lid and housing for sealing the lid and housing together thereby to define a sealed interior of said housing;

support means within said housing for maintaining said canisters in a predetermined orientation within the sealed interior of said housing;

means adapted to mount said housing to a substantially vertical bulkhead of a vessel thereby to maintain said canisters in an upright condition;

sump means disposed on the bottom of said housing in a depressed portion thereof whereby said sump means is at the vertically lowest point of said housing when bulkhead mounted; and

free flow conduit means for venting said sump vertically downward to a point external of said vessel above the water line and below said sump means whereby the sealed interior of said housing, external of the canisters therein, is vented downward to the exterior of said housing for free flow exhaust of heavier than air gases from said housing to the exterior of said vessel.

4,392,450

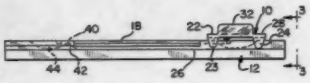
DEVICE FOR SPREADING MONOLAYERED FILMS

Donald L. Prevo, 907 Linden Ave., Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 234,011, Feb. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 185,020, Sep. 8, 1980, Pat. No. 4,359,013. This application Feb. 12, 1982, Ser. No. 348,209

Int. Cl.³ B05C 17/10

U.S. Cl. 118—120 18 Claims



1. A spreader for forming a monolayered film on a slide or the like from a fluid placed on the slide, the spreader being movable in a longitudinal direction along the length of the slide, said slide being held by a supporting surface comprising:

(a) a support having an upper surface and a lower surface;

(b) a bar extending in a transverse direction and downwardly along said lower surface of said support, said bar including:

(i) first and second sloped surfaces extending upwardly and in the longitudinal direction from the bottom of the bar toward said support, the first sloped surface comprising the forward end of the bar and the second sloped surface comprising the rear end of the bar;

(ii) a flat section formed at an angle to the lower end of said first sloped surface such that said flat section engages said slide or the like; and

(iii) a cutaway section adjacent to said flat section and formed at an angle to the lower end of said second sloped surface such that the top of said cutaway section is in close proximity with and is parallel to the slide on which the film is to be formed; and

(c) means extending downwardly from either side of said cutaway section for maintaining the flat section in contact with a slide and the top of the cutaway section in close proximity with and parallel to the slide whereby as the spreader is placed over a droplet of fluid on the slide, the fluid can diffuse between the cutaway section and the slide so that the monolayered film can be formed as the spreader is moved in the forward direction over the slide.

4,392,451

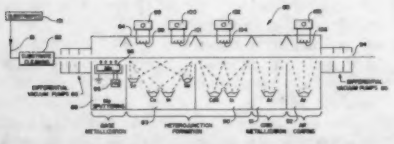
APPARATUS FOR FORMING THIN-FILM HETEROJUNCTION SOLAR CELLS EMPLOYING MATERIALS SELECTED FROM THE CLASS OF I-III-VI_2 CHALCOPYRITE COMPOUNDS

Reid A. Mickelsen, Bellevue, and Wen S. Chen, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 221,761, Dec. 31, 1980, Pat. No. 4,335,266. This application Jul. 2, 1981, Ser. No. 278,343

Int. Cl.³ C23C 13/10

U.S. Cl. 118—690 7 Claims



1. Apparatus for forming a photovoltaic light-to-electrical energy transducer of the type comprising a thin-film, A-B-type heterojunction formed on a substrate from a first ternary semiconductor material and a second semiconductor material, comprising, in combination:

(a) first means for forming a low-resistivity base metal contact on the substrate;

(b) second means for forming a transient A-B-type, thin-film homojunction on the base metal contact by simultaneous elemental evaporation of the constituent elements of the ternary semiconductor material, said second means including:

(i) means for monitoring the ratio of two of the constituent metallic elements of the ternary semiconductor material being evaporatively formed on the base metal contact;

(ii) means for establishing an initial ratio of the two constituent metallic elements being monitored so that the evaporation stream of elements being deposited on the base metal contact is slightly enriched by a slight excess of one metallic elemental constituent as compared to the stoichiometric condition of the ternary semiconductor material so as to permit formation of a first region of low resistivity semiconductor material on the base metal contact; and,

(iii) means for adjusting the ratio of the two constituent elements being monitored during simultaneous elemental evaporation thereof so that the evaporative stream of elements being deposited on the first region of low resistivity semiconductor material contains a slight deficiency of the one metallic elemental constituent as compared to the stoichiometric condition of the ternary semiconductor material so as to permit formation of a second region of relatively high-resistivity transient semiconductor material on the first region of low resistivity semiconductor material, thereby forming a transient A-B-type homojunction; and,

(c) third means for forming a low resistivity, thin-film layer of said second semiconductor material on the transient A-B-type homojunction with such layer in face-to-face contact with the second region of the transient homojunction and having a p-type or n-type state corresponding to the transient state of the high resistivity region; so that upon elemental interdiffusion of the elemental constituents formed on the substrate by said second and third means, the second region of relatively high resistivity transient semiconductor material is permitted to evolve into a relatively high resistivity region of semiconductor material having a p-type or n-type state corresponding to the state of the first region of low resistivity semiconductor material to thereby form a thin-film, A-B-type, heterojunction.

4,392,452

EVAPORATION DEVICE

Kazuhisa Taketoshi, Sagamihara, and Chihaya Ogusu, Tokyo, both of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Division of Ser. No. 213,016, Dec. 4, 1980, Pat. No. 4,352,834. This application Apr. 27, 1982, Ser. No. 372,389

Claims priority, application Japan, Dec. 26, 1979, 54-168076

Int. Cl.³ C23C 13/12

U.S. Cl. 118—723 10 Claims

1. An apparatus wherein a film consisting of a compound presenting a semiconductor characteristics or a solid solution thereof is deposited on a substrate in an atmosphere of an atomic state gas selected from a group consisting of hydrogen gas, oxygen gas and nitrogen gas with a partial pressure of 1×10^{-3} Torr or less said apparatus comprising:

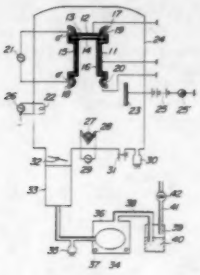
a vacuum container having a gas introduction path for introducing a gas selected from a group consisting of hydrogen gas, oxygen gas and nitrogen gas to said vacuum container and a gas exhaust path connected to a gas exhausting equipment for controlling a gas pressure and a vacuum condition in said vacuum container,

a discharging means disposed in said vacuum container and having a cathode with a heating power source and an anode to which a voltage is applied with respect to said cathode for producing said atomic state gas by activating

said gas by a discharge between said cathode and said anode,

an evaporation source disposed in said vacuum container for accommodating evaporation material and having an evaporation heater for heating said evaporation material,

a hot wall disposed in said vacuum container and having a hollow cylindrical body having a lower end opening for receiving a vapor evaporated from said evaporation source, an upper end opening being opposite to said lower



end opening in a direction apart from said evaporation source, and an inner surface at least on which a resistive film is deposited so that the resistive film is heated by an electric power supplied across both ends of said resistive film, and

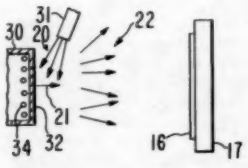
a substrate mounting member for mounting said substrate on said upper end opening of said hot wall on which said vapor evaporated from said evaporation source is deposited.

4,392,453

MOLECULAR BEAM CONVERTERS FOR VACUUM COATING SYSTEMS

Paul E. Luscher, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 26, 1981, Ser. No. 296,288
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—726 **32 Claims**



1. A molecular beam converter for use in a vacuum system for coating a substrate, said molecular beam converter comprising:

a body having an impingement surface generally facing said substrate;

a heating means to enable said impingement surface to be maintained at a designated temperature;

a molecular source for forming and directing an incident molecular beam onto said impingement surface;

impingement of said incident molecular beam on said impingement surface maintained at said designated temperature causing a converted molecular beam to flow from said surface;

said impingement surface and said molecular source in combination being configured to largely avoid impingement on said surface by molecular species in said converted molecular beam;

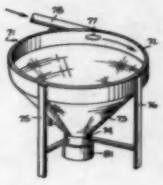
said impingement surface and said molecular source in combination being configured and positioned to direct said converted molecular beam generally toward said substrate.

4,392,454

APPARATUS AND METHOD FOR REARING SHRIMP

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both, Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 925,793, Jul. 18, 1978, Pat. No. 4,249,480.
This application Oct. 21, 1980, Ser. No. 199,209
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **1 Claim**



1. An Artemia collector for collecting Artemia contained in a flowing medium, said collector comprising:

an upper portion for receiving said flowing medium, said upper portion having aperture means therein for permitting passage of said flowing medium into said upper portion and having an inner wall for guiding said flowing medium;

intake means coupled to said aperture means for directing said flowing medium through said aperture means and along said inner wall;

frame means including first leg means attached at one end to said upper portion and slanting inwardly toward one another, and second leg means attached at one end to said upper portion and extending downwardly therefrom for supporting said collector;

mesh means for permitting passage of said flowing medium while retaining said Artemia, said mesh means being disposed within said first leg means and extending from said upper portion to the lower ends of said first leg means;

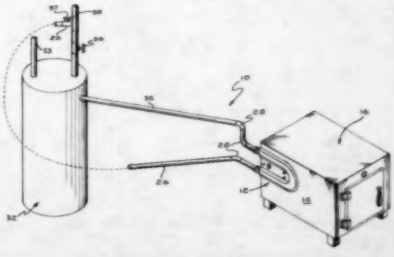
and sleeve means attached to said lower ends of said first leg means and to said mesh means.

4,392,455

HEAT-SINK WATER HEATER

Raymond C. Jarvis, Millers Falls Rd., Turners Falls, Mass. 01376

Filed Jun. 29, 1981, Ser. No. 278,044
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 A **6 Claims**



1. A water heater comprising:

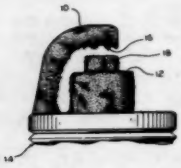
(a) a heat sink module having a relatively flat surface and a passage for fluid flow;
(b) said passage having an inlet connectable to a water source and a discharge connectable to a hot water line;
(c) means for attaching said module to an external wall of a stove to transfer heat from the stove to water flowing through the passage wherein said flat surface of said module is disposed substantially parallel to said external stove wall, and,
(d) adjustment means for selectively moving said module away from or closer to said external stove wall to regulate the amount of heat transferred from the stove to the module and thereby control the water temperature produced by the heater.

4,392,456

PREVENTION OF FOULING IN INTERNAL COMBUSTION ENGINES AND THEIR EXHAUST SYSTEMS AND IMPROVED GASOLINE COMPOSITIONS

Robert E. Davis, Hinsdale, Ill., assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,012
Int. Cl.³ F02B *77/04*
U.S. Cl. 123—1 A **18 Claims**



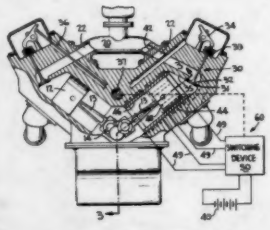
1. A process for operating gasoline engines with spark plug ignition which use a gasoline fuel containing methylcyclopentadienyl manganese tricarbonyl which comprises:
using as the gasoline fuel for said engines a gasoline containing methylcyclopentadienyl manganese tricarbonyl as an octane improver but containing no additives which include sodium or barium compounds; whereby fouling of the spark plugs with glass-like deposits formed from the oxidation reaction products of sodium and/or barium and manganese is avoided.

4,392,457

COMBUSTION AND ELECTRIC ENGINE

Jesse J. Martin, 4871 Milville-Reily Rd., Hamilton, Ohio 45013

Filed Dec. 31, 1980, Ser. No. 221,718
Int. Cl.³ F02B *75/00*
U.S. Cl. 123—1 R **13 Claims**



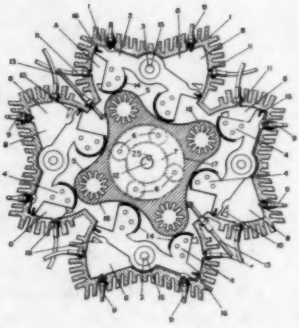
1. A combination internal combustion and electric engine comprising:
(a) a predetermined plurality of cylinders;
(b) a number of said cylinders less than said predetermined plurality comprising conventional fuel powered cylinders and a conventional fuel powered piston located in each of said conventional cylinders; and
(c) an electrically powered piston located in each of the remaining cylinders.

4,392,458

INTERNAL COMBUSTION ENGINE WITH DOUBLE OSCILLATING PISTONS

Henry E. Gummeringer, 13107 Marble, NE., Albuquerque, N. Mex. 87112

Filed Sep. 11, 1980, Ser. No. 186,120
Int. Cl.³ F02B *53/00*
U.S. Cl. 123—18 R **3 Claims**



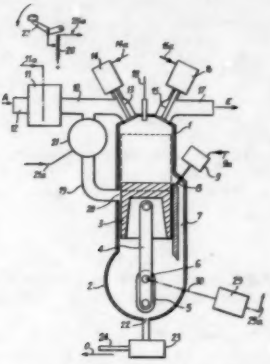
1. An oscillating piston internal combustion engine comprising:
a. a housing forming within a plurality of working chambers, and pivotally supporting between adjacent working chambers an oscillating piston, so that each side of each oscillating piston operates in one of the working chambers, and each said working chamber having therein a standard spark plug, and a fuel injection port, and an air input port and an exhaust port; and
each side of each oscillating piston having a cam arm having an irregular nearly circular shaped cam surface, and a cam gear having an irregular exterior cam surface with a plurality of lobes, and said cam gear having means for engaging a drive shaft, and
whereby when a combustible mixture is exploded in one working chamber on one side of an oscillating piston, the expanding gases from said explosion drive that side of the oscillating piston toward the cam gear, and the other side of the oscillating piston, having been exhausted and recharged with fresh air compresses the air therein and receives fuel by injection, and
wherein each side of the oscillating piston as it travels toward the cam gear near the limits of its travel exposes air input ports and exhaust ports, and
an air input blower which blows fresh air into the working chamber through the air input port and an exhaust blower which removes exhaust gases from the working chamber through the exhaust port, and
wherein the housing between the working chambers and between the pistons has mounted therein a spring loaded oiler wick, and
wherein the exhaust blower and the air input blower are driven from the driveshaft, and
wherein the injection of fuel and the ignition spark for each working chamber are timed.

4,392,459

FOUR STROKE THERMAL ENGINE CAPABLE OF TEMPORARY BOOST

Jean-Louis Chareire, Levallois, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Feb. 16, 1982, Ser. No. 348,868
Claims priority, application France, Feb. 18, 1981, 81 03201
Int. Cl.³ F02B 69/06, 41/00; F01L 9/02, 1/34
U.S. Cl. 123—21 7 Claims



1. In a thermal engine assembly provided with inlet and exhaust valves and with a system for controlling said engine comprising a computer which regulates opening and closure of said valves and which imposes on the engine an operation close to the one corresponding to minimum specific fuel consumption, said engine is essentially of the four-stroke cycle type, said system comprises means adapted to detect overloads of the engine and means adapted to cause the engine to operate exceptionally, in two-stroke mode, these latter means being actuated by said detection means when the detected overload exceeds a predetermined threshold so that the engine in that case passes to two-stroke operation, four-stroke operation being resumed as soon as the overload has disappeared.

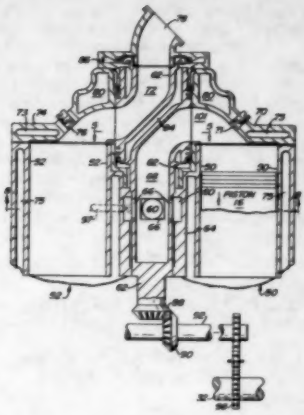
4,392,460

PARALLEL INHERENTLY BALANCED ROTARY VALVE INTERNAL COMBUSTION ENGINE

Thomas V. Williams, 415 Dresbertown Rd., Fort Washington, Pa. 19034

Filed Mar. 21, 1980, Ser. No. 132,606
Int. Cl.³ F01L 7/00
U.S. Cl. 123—80 BB 13 Claims

1. An internal combustion engine comprising
a first plurality of cylinders, each cylinder comprising a head, a piston, an inlet port and an exhaust port;
a second plurality of cylinders, each cylinder comprising a head, a piston, an inlet port and an exhaust port;
a first rotary fuel valve adjacent to said first plurality of cylinders and a second rotary valve adjacent to the said second plurality of cylinders,
each valve having a valve member mounted for rotation about an axis parallel to its adjacent cylinders for feeding a fuel-air mixture to each said cylinder,
each valve member having a fuel-air passage terminating in an outlet port for rotating alignment with a cylinder head of one of its adjacent cylinders for feeding a fuel-air mixture into each said cylinder inlet port,
each valve member having an exhaust passage terminating in an exhaust inlet port for rotating alignment with a cylinder head of another adjacent cylinder for exhausting gases from the said cylinder exhaust port;
crankshaft means coupled to said pistons for rotation relative to the cylinders, the crankshaft means comprising first and second crankshafts, at least one piston from each of the said first and second pluralities of cylinders being connected to each crankshaft;
a fuel injector means communicating with each fuel-air passage in all rotary positions of each valve member to feed a fuel-air mixture into each fuel-air passage;



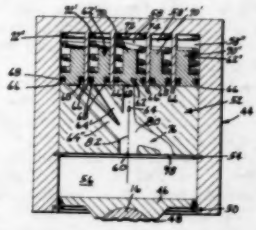
drive means for rotating the valve members continuously about their respective longitudinal axes; and
gear means connected to rotate simultaneously the first and second rotary valves,
the said gear means being adapted to rotate the first and second rotary valves in opposite directions.

4,392,461

ROCKER ARM ADAPTER FOR ALTERING CAM PROFILE OF EXHAUST VALVE

Richard Rotondo, 3804 Highcrest Rd., St. Anthony Village, Minn. 55421

Filed Nov. 10, 1980, Ser. No. 205,728
Int. Cl.³ F01L 1/34, 1/24
U.S. Cl. 123—90.16 16 Claims



1. In combination with a rocker arm having first and second ends and mounted for pivoting movement between first and second positions and about a pivot intermediate the ends, wherein the second end engages a valve stem of a valve of an automobile engine and the rocker arm overcomes a bias urging the valve to a closed position and opens the valve as it moves from its first position to its second position, and a push rod engaging the first end to pivot the rocker arm from its first to its second position as the push rod moves longitudinally; a fluidic delay device, comprising means formed in the rocker arm at one end thereof, said means including a piston disposed for movement into and out of a cavity formed in said one end and engaged by one of the valve stem and push rod, and means

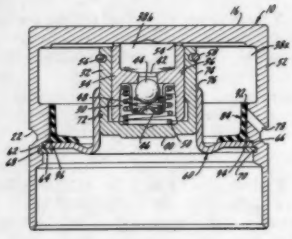
for precluding movement of said piston into said cavity beyond various positions, wherein said piston moves into said cavity to different of said positions, depending upon the speed of longitudinal movement of the push rod, as the rocker arm is urged from its first position to its second position, said means for precluding movement of said piston comprising a manifold member mounted in said cavity to define an exterior chamber in which said piston moves, and a plurality of interior chambers having different volumes, said member having formed therethrough an inflow passageway communicating with said exterior chamber and dividing into a plurality of outflow channels, each of said channels entering into a different of said interior chambers; a fluid filling said exterior chamber, said inflow passageway, said outflow channels, and said interior chambers; and means responsive to said speed of longitudinal movement of the push rod for channeling the bulk of fluid flow in said inflow passageway induced by movement of said piston into said exterior chamber, into a different of said outflow channels.

4,392,462

INVERTED BUCKET TAPPET WITH SEAL

Kenneth W. Lesher, Wheaton, Ill., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Dec. 22, 1980, Ser. No. 219,266
Int. Cl.³ F01L 1/24
U.S. Cl. 123—90.55 **3 Claims**



1. In a self-compensating hydraulic lash adjuster, a cup-shaped follower, a body supported thereon, a spacer attached to said follower and supporting said body, said spacer, body and follower defining a fluid reservoir, a piston assembly positioned within said body and defining a compression chamber therewith, check valve controlled passage means between said reservoir and compression chamber,

a fluid passage in said follower opening into said reservoir, and a somewhat L-shaped elastomeric seal seated upon said spacer and masking said fluid passage, the upright portion of said L-shaped elastomeric seal functioning to admit hydraulic engine fluid through said passage to said fluid reservoir, to block the reverse flow through said passage from said reservoir, and to seal against the leakage of fluid from said reservoir between said spacer and follower, the base of said L-shaped elastomeric seal being seated upon and supported by said spacer.

4,392,463

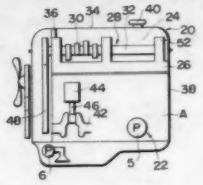
DIESEL ENGINE HAVING A DUAL LUBRICATION SYSTEM

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 7, 1980, Ser. No. 176,216
Int. Cl.³ F01M 1/00
U.S. Cl. 123—196 M **2 Claims**

1. A method of lubricating the working parts of a diesel engine equipped with an exhaust gas recirculation system, said working parts including a valve train whose lubricant is substantially prevented from being exposed to exhaust gases and other working parts whose lubricant may be exposed to exhaust gases, said method comprising:

lubricating the engine working parts except for the valve train with diesel fuel;



using the diesel fuel after the same has served as a lubricant for fuel for the engine; and

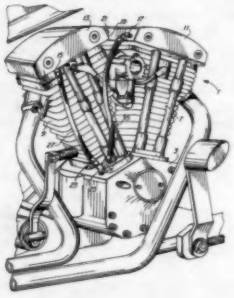
lubricating the valve train with a separate lubrication system.

4,392,464

CYLINDER HEAD OIL DISTRIBUTION SYSTEM FOR CERTAIN HARLEY-DAVIDSON MOTORCYCLE ENGINES

Kenneth E. Woodward, 3911 E. Weldon Ave., Phoenix, Ariz. 85018, and Terry L. Zeiger, 1517 E. Dolphin, Mesa, Ariz. 85204

Filed May 26, 1981, Ser. No. 266,802
Int. Cl.³ F01M 1/00
U.S. Cl. 123—196 R **4 Claims**



1. An improved oil distribution apparatus for distributing oil through the front and rear cylinder heads of a HARLEY-DAVIDSON twin cylinder V-type motorcycle engine having said front cylinder inclined at a 45° angle relative to said rear cylinder and having only a single threaded oil outlet from the crankcase thereof, said rear cylinder head having a threaded oil inlet disposed in a lower portion of said rear cylinder head, said rear cylinder head also having a threaded oil outlet disposed in a front side of said rear cylinder head, said front cylinder head having a threaded oil inlet disposed on a rear side of said front cylinder head, said apparatus comprising in combination:

(a) a tubular Y fitting means having a first tubular extension with a threaded portion for threaded sealing engagement with said crankcase oil outlet;

(b) a first oil tube external to said front and rear cylinders having an upper fitting sealably attached to an upper end thereof for threaded, sealing engagement with said oil inlet of said rear cylinder head;

(c) a first fitting for removable, sealable, connecting of the lower end of said first oil tube to a second tubular extension of said Y fitting means;

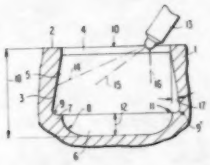
(d) a second oil tube external to said front and rear cylinders;
(e) a second fitting for removable, sealable, connecting of the lower end of said second oil tube to a third tubular extension of said Y fitting means;
(f) a third fitting for removable, sealable, connecting of the upper end of said second tube to said oil inlet of said front cylinder head; and
(g) a threaded plug for sealing closed said oil outlet for said rear cylinder head.

4,392,465

SELF-IGNITING INTERNAL COMBUSTION ENGINE WITH A ROTATIONALLY SYMMETRICAL PISTON TROUGH

Gerhard Wolters, Gaggenau, and Wilhelm Wagner, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,028
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3025943; Apr. 22, 1981, 3115933
Int. Cl.³ F02B *19/08*
U.S. Cl. 123—263 **4 Claims**



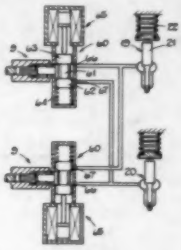
1. Self-igniting internal combustion engine with a rotationally symmetrical piston trough exhibiting in cross section a flat bottom well rounded at the rim and conical sidewalls, and wherein the inlet opening is smaller than the largest diameter of the piston trough, and with an injection nozzle injecting into the piston trough so that the walls are wetted, characterized by the combination of the following features:
(a) the diameter of the inlet opening is about 0.35–0.43 times the piston diameter, and the total depth of the piston trough is about 0.6–0.8 times the diameter of the inlet opening;
(b) the angle of conicity of the sidewalls is about 7–15°;
(c) a continuously extending, projecting annular bead formed, in cross section, by two bead flanks converging approximately at a right angle is provided in the transition zone between the sidewall and the bottom, the annular bead flank of this annular bead facing the inlet opening lying, in cross section, approximately in parallel to the piston crown, and the continuously extending rim of this annular bead extending in parallel to the piston crown;
(d) the axial spacing of the plane of the annular bead flank from the bottom of the piston trough corresponds approximately to 12–33% of the total depth of the piston trough;
(e) the diameter of at least one annular bead flank corresponds approximately to 0.9–1.1 times the diameter of the inlet opening;
(f) the annular bead flank facing the bottom of the piston trough passes over, in cross section, with a radius of about 22–35% of the total depth into the bottom and the annular bead flank facing the inlet opening passes over, in cross section, with a radius of about 2–5 mm into the sidewall;
(g) the injection nozzle, arranged eccentrically to the piston trough but still within the inlet opening thereof, directs its jets onto the sidewall of the piston trough in such a way that the point of impingement of the injection jets lies axially approximately in the center between the annular bead rim and the piston crown.

4,392,466

FUEL SYSTEM FOR ENGINES

Dorian F. Mowbray, Burnham, and Boaz A. Jarrett, London, both of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 111,469, Jan. 11, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,273
Claims priority, application United Kingdom, Oct. 5, 1979, 7934620
Int. Cl.³ F02B *3/00*; F02M *41/00*
U.S. Cl. 123—299 **3 Claims**



1. A direct injection type fuel system for supplying fuel to a compression ignition engine comprising inwardly opening type nozzles which are mounted on the associated engine to direct fuel into the combustion chambers of the engine respectively, electromagnetically operable pumps for supplying fuel under pressure to the nozzles respectively, and change over valves associated with the pumps respectively, each valve having a connection to the associated pump and a pair of outlets, first conduit means connecting a first one of said outlets to the associated nozzle and second conduit means connecting said first conduit means to the second one of the pair of outlets of another of said change over valves, said valves being operable so that when fuel is supplied to a particular nozzle the fuel which is supplied to that nozzle is derived from the pump associated with that nozzle when the fuel required is equal to or less than one-half the maximum amount required by that nozzle and can be supplemented by fuel supplied to that nozzle simultaneously with the fuel supplied thereto by the pump associated with that nozzle by a pump associated with another of said nozzles when the fuel required is greater than one-half the maximum amount required by that nozzle.

4,392,467

METHOD FOR OPERATING FUEL INJECTOR IN A COMPUTER CONTROLLED FUEL INJECTION TYPE INTERNAL COMBUSTION ENGINE

Hideo Miyagi, Okazaki; Toshio Suematsu, Toyota; Jiro Nakano, Okazaki, and Hironobu Ono, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

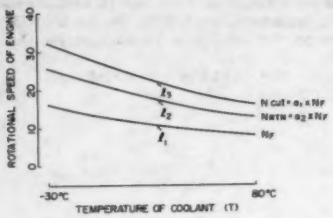
Filed Jul. 22, 1981, Ser. No. 285,313
Claims priority, application Japan, Sep. 16, 1980, 55-127090
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—325 **2 Claims**

1. Method for controlling the operation of a fuel injector in a computer controlled fuel injection internal combustion engine, which engine is provided with a system for maintaining a predetermined idling rotational speed N_F in accordance with the temperature of the engine and with a system for controlling the operation of the fuel injector during the deceleration condition of the engine so that the injector is de-energized when the rotational speed is higher than N_{cut} and injector is energized when the rotational speed is lower than N_{RTN}, said method comprising the steps of:
storing in the computer values of N_F in accordance with the temperature of the engine;

detecting the temperature of the engine;

reading out the value of N_F corresponding to the detected temperature;

calculating, as the value of N_{CUT}, the product of a constant



positive value α_1 larger than 1.0 and the read out value of N_F, and;

calculating, as the value of N_{RTN}, a product of constant positive value α_2 larger than 1.0 but less than α_1 and the read out value of N_F.

4,392,468

METHOD AND APPARATUS FOR CONTROLLING THE IDLING SPEED OF AN ENGINE

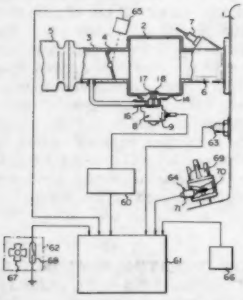
Mamoru Kobashi, Aichi, and Hiroshi Itoh, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 9, 1981, Ser. No. 281,854

Claims priority, application Japan, Jan. 23, 1981, 56-8140; Jan. 23, 1981, 56-8146; Jan. 23, 1981, 56-8148

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—339 **10 Claims**



1. A method of controlling the idling speed of an engine comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branched off from the main intake passage upstream of the throttle valve and connected to the main intake passage downstream of the throttle valve, a control valve arranged in the bypass passage, and a stepper motor actuating the control valve for controlling the amount of air flowing within the bypass passage, said method comprising the steps of:

detecting a step position of the stepper motor;

obtaining the mean value of the step position over a predetermined time;

calculating the lower limit of the step position, said lower limit being obtained by subtracting a predetermined step number from said mean value of the step position; and

stopping the stepper motor from rotating in a direction wherein the control valve closes when the step position of the stepper motor reaches said lower limit.

4,392,469

RPM REGULATING DEVICE FOR THE FUEL INJECTION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

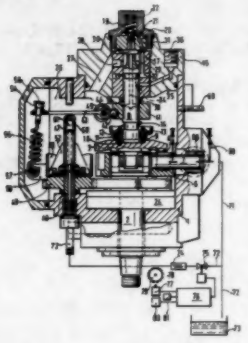
Wolf Wessel, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,079

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038293

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—387 **7 Claims**



1. In a fuel injection apparatus for internal combustion engines, including: a fuel supply pump; a housing defining an inner chamber into which fuel is delivered by the fuel supply pump; a fuel injection pump delivering fuel from the inner chamber to the engine; an rpm regulator having an adjustable governor member; adjustable lever means associated with said governor member for initial setting thereof; a work chamber disposed in said governor member communicating via a throttle with said inner chamber; bore means provided within said governor member in communication with said work chamber; and an hydraulic setting mechanism which varies the moment of fuel delivery by the fuel injection pump as a function of pressure in the inner chamber, the improvement comprising:

a control line connects said bore means with a fuel supply tank; said control line is further provided with a magnetic valve to control fuel flow; said magnetic valve is further connected to an electronic control device; and said electronic control device includes at least one sensor for measuring at least one operational characteristic of the internal combustion engine.

4,392,470

TEMPERATURE RESPONSIVE OPEN/CLOSED LOOP SWITCHING FOR LAMBDA CONTROL

Dieter Günther, Murr; Richard Bertsch, Asperg; Siegfried Böttcher, Remseck; Herbert Arnold, Eberdingen; Hans Schnürle, Walheim, and Michael Horbelt, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,757

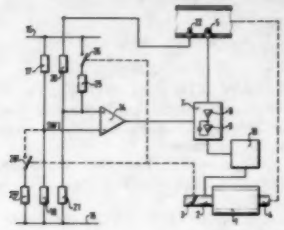
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024606

Int. Cl.³ F02B *33/00*

U.S. Cl. 123—440 **3 Claims**

1. A lambda regulating device for the composition of the operating mixture being combusted in an internal combustion engine comprising, an exhaust gas probe producing an output signal and being applied to said lambda regulating device for correcting the operating mixture composition, a means supplying a temperature signal a means for deactivating and activating said lambda regulating device in accordance with the evaluation of said temperature signal, a threshold switch hav-

ing two inputs connected to said lambda regulating device, one of said inputs being responsive to said temperature signal, a threshold value generating means responsive to said threshold switch, and a switchover means controllable in accordance



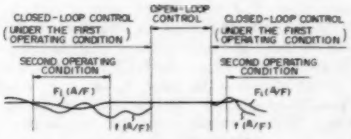
with a position of a throttle valve of said engine for switching said threshold switch between a low and a high value with respect to said temperature signal, said switchover means being reversible up to the point where the higher value has been attained.

4,392,471

METHOD AND APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Hideo Miyagi, and Jiro Nakano, both of Okazaki, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 24, 1981, Ser. No. 296,241
Claims priority, application Japan, Sep. 1, 1980, 55-119830
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—489 **22 Claims**



1. An air-fuel ratio control method of an internal combustion engine, comprising the steps of:

detecting the concentration of a predetermined component in the exhaust gas in the engine;

detecting the operating condition of the engine to discriminate whether or not the engine is in a predetermined first operating condition;

calculating an air-fuel ratio correction coefficient depending upon said detected concentration, when the engine is in the first operating condition;

holding an air-fuel ratio correction coefficient to a value, when the engine is not in the first operating condition;

detecting the operating condition of the engine to discriminate whether or not the engine is in a predetermined second operating condition which is included within said first operating condition;

calculating an average value of said calculated air-fuel ratio correction coefficient only when the engine is in the second operating condition; and

correcting the amount of fuel supplied to the engine in accordance with said air-fuel ratio correction coefficient, said correcting being performed by a closed-loop control when the engine is in the first operating condition and performed by an open-loop control when the engine is not in the first operating condition, an initial value of the air-fuel ratio correction coefficient when said fuel correction changes from open-loop control to closed-loop control being determined according to said calculated average value.

12. Apparatus for controlling the air-fuel ratio in an internal combustion engine, comprising:

means for detecting the concentration of a predetermined component in the exhaust gas in said engine;

means for detecting the operating condition of said engine to discriminate whether or not the engine is in a predetermined first operating condition;

means for detecting the operating condition of said engine to discriminate whether or not said engine is in a predetermined second operating condition which is included within said first operating condition;

processing means, responsive to said concentration detecting means, said first operating condition correcting means and said second operating condition correcting means, said processing means for (1) determining an air-fuel ratio correction coefficient depending upon said detected concentration, when the engine is in the first operating condition; (2) holding an air-fuel ratio correction coefficient to a value, when the engine is not in the first operating condition; and (3) determining an average value of said calculated air-fuel ratio correction coefficient only when the engine is in said second operating condition, said average value being employed to control said air-fuel ratio when said fuel correction changes from open-loop control to closed-loop control; and

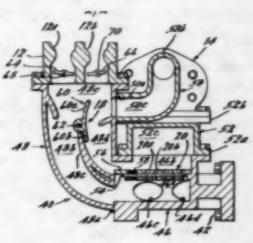
means for correcting the amount of fuel supplied to the engine in accordance with said air-fuel ratio correction coefficient.

4,392,472

INDUCTION SYSTEM FOR SUPERCHARGED ENGINE

Robert C. Merritt, Corning, N.Y., and Gerald L. Terwilliger, Wixom, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1980, Ser. No. 214,304
Int. Cl.³ F02D *23/00*; F02B *33/44*
U.S. Cl. 123—564 **39 Claims**



1. In an induction system adapted to supply combustion air to an expansible chamber of an engine including a supercharger having an inlet and an outlet; the system including first and second air flow paths connected in parallel, the first path adapted to deliver unsupercharged air to the chamber, and the second path adapted to deliver air to the supercharger inlet and from the supercharger outlet to the chamber, the improvement comprising:

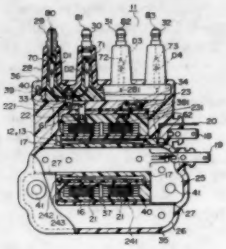
a recirculation path adapted to deliver air from the supercharger outlet back to the supercharger inlet; and

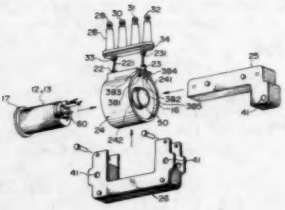
valve means movable between first and second positions for controlling the air flow in said paths, said valve means operative in said first position to allow air flow to the chamber via the first path and to allow air flow in said recirculation path from the supercharger outlet back to the supercharger inlet, and said valve means operative in said second position to allow supercharged air flow to the chamber via the second path and to block air flow in the first and recirculation paths.

4,392,473
IGNITION COIL FOR AN INTERNAL COMBUSTION ENGINE

Mitsukuni Tsutsui, Naka, and Takashi Yoshinari, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,661
Claims priority, application Japan, Nov. 22, 1979, 54-151670
Int. Cl.³ F02P 3/06
U.S. Cl. 123—635 **12 Claims**





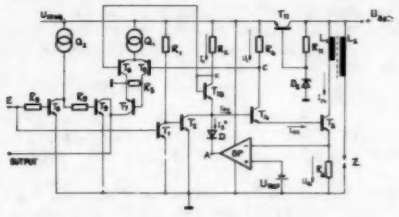
1. An ignition coil for an internal combustion engine for producing high voltage signals to spark plugs of the internal combustion engine, the ignition coil comprising at least one primary coil to which primary current signals are supplied in sychronism with a rotational speed of the internal combustion engine, a secondary coil electromagnetically coupled to said at least one primary coil for producing high voltage signals in response to the primary current signals, high voltage terminals for enabling a connection of the secondary coil with the spark plugs, high voltage diodes disposed between the secondary coil and the high voltage terminals, means for electrically connecting the secondary coil to the high voltage diodes, a case means formed at least in part from an insulating material having the high voltage terminals mounted thereon and accommodating the high voltage diodes therein in a manner so as to be insulated with respect to each other, and a synthetic resin for enveloping the primary and secondary coils and integrally joining the case to said primary and secondary coils.

11. An ignition coil for an internal combustion engine for producing high voltage signals synchronized with a rotational speed of the engine to spark plugs of the engine, the ignition coil comprising at least one primary coil, at least one secondary coil coupled to said primary coil, high voltage terminals for enabling connection of the secondary coil with the spark plus, high voltage diodes disposed between the secondary coil and the high voltage terminals, a case made of a synthetic resin having concentric inner and outer walls and a bottom wall bridging said inner and outer walls at one end portion thereof so as to form a first center hollow cylinder extending inside said inner wall and a space for accommodating the secondary coil between said inner and outer walls, terminal means attached to said outer wall of said case having one end connected electrically with a coil end of the secondary coil and a second end electrically connected with said high voltage diodes, a bobbin adapted to be inserted in said first center hollow cylinder and formed with a second center hollow cylinder extending in an axial direction thereof, the primary coil being wound on said bobbin, a resin composite impregnating around said bobbin and said case, and a magnetic core disposed in said second center hollow cylinder, said synthetic resin case being integrally molded with said high voltage diodes and said high voltage terminals.

4,392,474
ELECTRONIC IGNITION SYSTEM

Willy Misner, Schwaigern, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,395
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015939
Int. Cl.³ F02P 3/00, 3/04, 5/04
U.S. Cl. 123—644 **7 Claims**



1. An electronic ignition system comprising: an ignition coil having a primary winding and a secondary winding; means defining a spark gap in series with said secondary winding; a primary transistor and a current limiting circuit in the circuit of said primary winding; a further transistor connected to be controlled by a control signal and connected in front of said primary transistor for controlling said primary transistor, said further transistor presenting a current path; a resistor network in the current path of said further transistor; and means connected to said further transistor and said resistor network for deriving pulses whose width represents the residence time of maximum current through said primary winding from the voltage curve at said resistor network and wherein said further transistor and said resistor network constitute means for causing said further transistor to operate in its saturation region when there is a rise in current in said primary winding and for producing a jump in voltage to a constant maximum value at said resistor network when the current in said primary winding is limited to its maximum value by said current limiting circuit.

4,392,475
BOWSTRING RELEASE DEVICE

James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205

Filed Jan. 30, 1981, Ser. No. 229,890
Int. Cl.³ F41C 19/00, 5/00
U.S. Cl. 124—35 A **2 Claims**

1. An improved mechanical bowstring release device comprising, in combination:

a. a hollow housing having a space therein;

b. a link positioned in said space;

c. a bowstring retainer pivotably secured in said space in said housing and including a retaining end extending through an opening in said housing when said retainer is in a locked bowstring-drawing first position, said retaining end being movable to an unlocked bowstring-releasing second position, said retainer also including a coupling end; and,

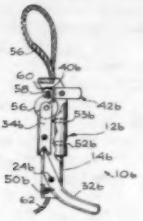
d. trigger means for locking said retainer in said first position and for urging said retainer into said unlocked second

position to release said bowstring, said trigger means including:

i. coupling means comprising a slot in said retainer coupling end with a bearing point in said slot and a wheel rotatably secured to the front end of said link and releasably engageable with said bearing point,

ii. said link being pivotably secured to and extending longitudinally of said housing in said space, the front portion of said link being engaged with said coupling means, the rear portion of said link defining a rearwardly facing receptacle,

iii. a trigger arm extending outwardly of said housing



through an opening therein and pivotably secured in said space behind said link, the front portion of said trigger arm extending into said receptacle, and,

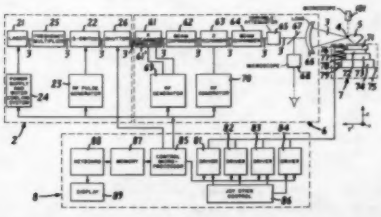
iv. an automatic locking spring disposed in said space generally laterally against the portion of said trigger arm which is forward of the pivot point of said arm, said spring urging said front portion of said trigger arm against said link to move said coupling means to a position to cause said retainer to move into said first locked position, whereby movement of said trigger arm against said spring is necessary to urge said link and coupling means to move said retainer to said second unlocked position to effect instant release of said bowstring.

4,392,476

METHOD AND APPARATUS FOR PLACING IDENTIFYING INDICIA ON THE SURFACE OF PRECIOUS STONES INCLUDING DIAMONDS

Herbert D. Gresser, Plainview; George Kaplan, Port Chester, and Joseph Nussenbaum, New York, all of N.Y., assignors to Lazare Kaplan & Sons, Inc., New York, N.Y.

Filed Dec. 23, 1980, Ser. No. 220,195
Int. Cl.³ B28D *5/00*
U.S. Cl. 125—30 R **52 Claims**



1. A method for providing an identifying indicium to a diamond comprising:

applying a laser beam to a surface of said diamond;

and controlling said laser beam to enable said laser beam to inscribe into said diamond surface an indicium including:

intermittently moving said laser beam to successive positions on said diamond surface along a path corresponding to said indicium, said beam at each position covering a diamond surface area overlapping the diamond surface area covered by the beam at the immediately preceding position on said indicium;

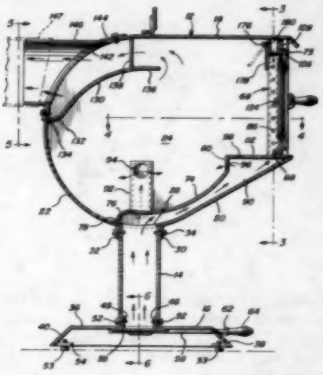
and adjusting the laser beam power to graphitize and inscribe said diamond surface at each of said positions.

4,392,477

SOLID FUEL BURNING STOVE

Orley J. Milligan, 2319 Crater Lake Ave., Medford, Oreg. 97501

Filed Apr. 29, 1981, Ser. No. 258,633
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **6 Claims**



1. A heater including a firebox for receiving and burning solid fuel therein, said firebox including a lower wall, a pair of spaced upstanding opposite side walls, a top wall extending between said side walls, a forwardly opening semi-cylindrical rear wall extending between said top and lower walls and between said opposite side walls and combustion air inlet manifold means into which a combustion air inlet means opens, said firebox including a forward portion in which a hollow peripheral frame is mounted, said frame extending peripherally about at least a majority of the inside periphery of the forward portion of said firebox, said combustion air manifold means including a portion thereof opening into the interior of said frame, said frame including air curtain forming air outlet openings formed therein and spaced peripherally thereabout opening inwardly of the corresponding peripheral portion of said frame, a door assembly removably closing the forward portion of said firebox, said door having a heat resistant transparent window therein, said air curtain forming outlets openings being disposed closely rearward of said window and being operative to discharge a curtain of combustion air across the inner surface of said window.

4,392,478

PORTABLE HEAT CIRCULATION MEANS

Hugh J. Black, 39 Iowana Ave., Trenton, N.J. 08638

Filed Jul. 13, 1981, Ser. No. 282,692
Int. Cl.³ F24C *15/20*; F24H *3/02*
U.S. Cl. 126—84 **12 Claims**

1. A portable heat circulation means, particularly adapted to be placed upon heaters such as kerosene heaters, comprising:

(a) a plenum housing means defining a plenum chamber therein and adapted to be positionable upon a heater, said plenum housing means defining a plenum intake means therein to receive warm air to be gathered within said plenum chamber, said plenum housing further comprising:

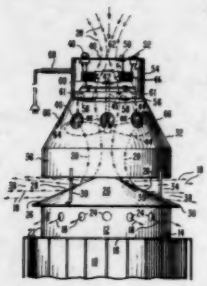
1. a plenum wall means extending about said plenum chamber and defining a plurality of hot air apertures

therethrough establishing fluid flow communication between said plenum chamber and the external environment; and

2. a plenum top means extending over said plenum wall means to define said plenum chamber therebelow, said plenum top means being generally convex in an upwardly facing direction to provide:

a. a convex convection surface thereabove;

b. a main housing means fixedly secured above said plenum housing means and defining a cool air inlet adjacent said convex convection surface, said main



housing means defining a cool air chamber therein, said main housing means and said plenum housing means defining a main outlet means therebetween, said main housing means defining a cool air inlet means therein; and

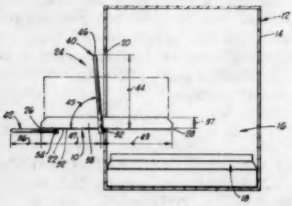
c. a blower means located within said main housing means and being operative to draw air inwardly through said cool air inlet means into said cool air chamber and outwardly through said cool air outlet means along said convex convection surface for heating thereof and out through said main outlet means into the surrounding environment.

4,392,479

FUEL LOADER

Eugene V. Stair, Rte. 1, Caddo, Okla. 74729

Filed May 21, 1981, Ser. No. 266,123
Int. Cl.³ F23J *1/00*
U.S. Cl. 126—242 **5 Claims**



1. A fuel loader adapted for loading fuel into a stove having a frame with a firebox disposed in the frame, a grate being supported in the firebox adapted to support fuel within the firebox and a firebox opening being provided through the frame providing access to the firebox and the grate disposed therein, the fuel loader comprising:

a base having a first end, a second end, a first side and a second side, the base having a supporting surface sized and adapted for supporting the fuel to be loaded into the stove firebox and a portion of the base being disposable through the firebox opening and into the firebox; and

a handle assembly connected to the base, the handle assembly being grippable by an individual for manually maneuvering a portion of the base near the second end of the base through the firebox opening and into the firebox for loading the fuel supported thereon into the firebox; comprising:

an end handle connected to the base, one end of the end handle being connected to the base generally near the first side of the base and the opposite end of the end handle being connected to the base generally near the second side of the base, the end handle extending a distance generally from the first end of the base; and

an upper handle, one end of the upper handle being connected to the base generally near the first side of the base and the opposite end of the upper handle being connected to the base generally near the second side of the base, the upper handle extending a distance generally above the supporting surface of the base and a portion of the upper handle extending generally over the supporting surface of the base generally between the first and the second sides of the base, the upper handle being connected to the base at a position spaced a distance from the first end of the base and spaced a distance from the second end of the base to facilitate the balancing of the fuel loader with the fuel supported generally on the supporting surface of the base; and

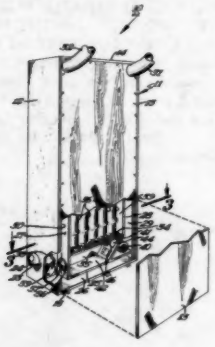
stop means connected to the base and extending a distance therefrom, the stop means being positioned for engaging a portion of the frame of the stove to position the fuel loader in a loading position wherein a portion of the base with the fuel supported thereon extends into the firebox and generally above the grate.

4,392,480

HEAT STORAGE AND DELIVERY APPARATUS

Wayne Vautrin, Rte. #2, Park Rapids, Minn. 56470

Continuation of Ser. No. 242,895, Mar. 12, 1981, abandoned.
This application Jun. 28, 1982, Ser. No. 393,066
Int. Cl.³ F24H *7/00*; F24J *3/02*
U.S. Cl. 126—400 **10 Claims**



1. A heat storage apparatus, comprising:

a rectangular shaped cabinet,

delivery and return passages in said cabinet, said passages being adapted to be connected in communicating relation with a heat generator to permit heated air to be circulated between the heat generator and cabinet,

an inlet and an outlet in said cabinet intercommunicating the interior of the cabinet with the exterior, said inlet being connected in communicating relation with said return passage,

heat collecting chamber means in said cabinet, a plurality of

vertically disposed elongate heat storage rods positioned in said heat collecting chamber means and arranged in side by side relation with respect to each other,

a charging blower in said cabinet being operable when energized to cause heated air to be drawn from the heat generator into the delivery passage of the cabinet,

first valve means between the delivery passage and said heat collecting chamber and being operable when said charging blower is energized to cause heated air drawn from the heat generator into the delivery passage into said heat collecting chamber over said rods and thereafter into the return passage for return to the heat generator whereby heat exchange action occurs between the heated air and heat storage rods so that heat is stored in the latter,

a diffuser member in said heat collecting chamber being operable to cause the air directed into the heat collecting chamber from the charging blower to be uniformly distributed over the heat storage rods,

a delivery blower in said cabinet spaced from said charging blower, and when energized causing external unheated air to be drawn into the cabinet through the inlet into said return passage,

air control means between the delivery blower and the heat collecting chamber being operable when the delivery blower is energized to direct the unheated air through the heat collecting chamber and over the heat storage rods whereby the air will be heated and then directed by the delivery blower through the outlet into the exterior,

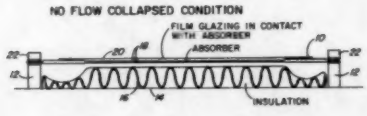
and control means including the circuitry arranged in controlling relation with respect to said charging and delivery blowers, first temperature responsive means in said circuitry being operable in response to the temperature within the heat generator reaching a predetermined magnitude to energize the charging blower to direct heated air from the heat generator into the heat collecting chamber, additional heat responsive means in said circuitry being operable to energize the delivery blower when the temperature within the collecting chamber reaches a predetermined temperature and when the external temperature outside the cabinet reaches a predetermined temperature to cause outside unheated air to be directed into the inlet over the heat storage rods to heat the air, and thereafter, discharge the heated air to the exterior.

4,392,481

SOLAR COLLECTOR APPARATUS HAVING INCREASED ENERGY REJECTION DURING STAGNATION

Stanley W. Moore, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1981, Ser. No. 225,493
Int. Cl.³ F24J 3/02
U.S. Cl. 126—418 **1 Claim**



1. An apparatus for temperature limiting a solar collector comprising:

an absorber;

a layer of insulation disposed beneath said absorber;

glazing disposed over said absorber, said absorber and said glazing being constructable from materials incapable of withstanding temperatures above about 180° F. for an extended period of time, said glazing comprising the topmost layer of said apparatus and said glazing being heat mirror coated to give it a low ϵ inner surface to eliminate radiation and convection resistance during stagnation periods; and

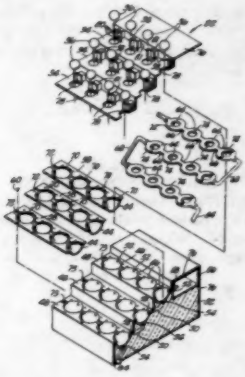
means for spacing said glazing away from said absorber during operation of said collector and for bringing said glazing substantially in contact with said absorber during stagnation to substantially increase energy convected and re-emitted from said collector, thereby maintaining a temperature below about 180° within the said apparatus during stagnation.

4,392,482

SOLAR HEATING PANEL ARRANGEMENT

Moo K. Chang, 11979 Iowa St., Los Angeles, Calif. 90025

Continuation-in-part of Ser. No. 73,644, Sep. 10, 1979, abandoned. This application May 26, 1981, Ser. No. 267,346
Claims priority, application Rep. of Korea, Aug. 2, 1979, 372/1979
Int. Cl.³ F24J 3/02
U.S. Cl. 126—440 **24 Claims**



1. A solar heating panel arrangement comprising:

a plurality of spherical lenses for transmitting and focusing incident solar radiation;

fluid passage means having upper and lower boundary portions defining a series of relatively thin hemispherical fluid passages concentric with said lenses, respectively, said upper boundary portions being in heat transfer proximity to fluid flowing through the passages and having upper surfaces which include the focal points of the lenses for incident solar radiation of various directions; and

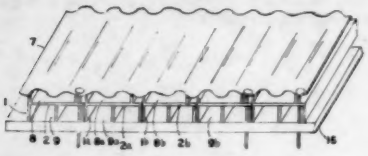
means for reflecting solar radiation onto the lenses for transmission to the upper boundary portions, said reflecting means including a plurality of multifaceted reflective structures each comprising three planar reflective portions arranged vertically about a portion of one of the lenses;

such that solar radiation is focused at a plurality of locations on each of said upper boundary portions to heat said fluid, one of said locations representing radiation directly incident on the corresponding lens and the other location or locations representing radiation reflected onto the lens by said reflecting means.

4,392,483
SOLAR COLLECTOR MEANS

Robert H. Koenig, 21 Barrington Pl., Huntington Hills, N.Y. 11746

Filed Apr. 13, 1981, Ser. No. 253,303
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 7 Claims

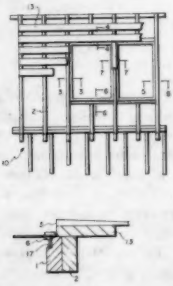


1. Solar collector means comprising:
a modular rigid structure having a web portion,
lower support means connected to the web portion,
upper support means connected to the web portion,
a clear corrugated member mounted on the upper support members, the web portion, the upper support members and the clear member forming a trap, said structure being a unitary molded piece with said upper support means being chosen to nest with said clear corrugated fiberglass,
whereby when the structure is mounted on an inclined roof it forms an air passage between the web and the roof and with the clear member facing the sun, the air in the air passage below the web will be heated and flow up through the air passage.

4,392,484
BUILT-IN SOLAR PANEL

Michael J. Aloi, 1743 S. Tuxedo, and Kevin J. Hancock, II, 8713 Los Olivas Ct., both of Stockton, Calif. 95204

Division of Ser. No. 102,616, Dec. 11, 1979, Pat. No. 4,273,108. This application Jun. 15, 1981, Ser. No. 273,287
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 4 Claims



1. A method of installing a solar panel comprising cutting rafters and sheeting to provide an opening substantially the dimensions of the panel, affixing a panel frame to the rafters, providing a step portion on an upper inner periphery of the panel frame, providing upper and lower conduits within the frame and interconnecting the conduits with tubes, deploying a frame lower portion on the step portion, placing a transparent panel thereover and affixing an upper frame portion thereto.

4,392,485
ENDOSCOPE

Siegfried Hiltebrandt, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

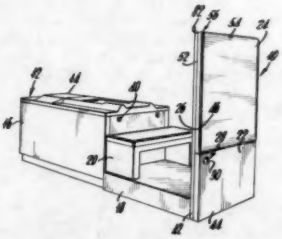
Filed Apr. 21, 1981, Ser. No. 256,029
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 8104329[U]
Int. Cl.³ A61B 1/06
U.S. Cl. 128—6 2 Claims

1. Endoscope having an external shaft through which passes a guide channel for receiving instruments, a fibre light conductor and an optic, the proximal part of said optic being turned away from one side of the proximal part of the shaft, and in which the inner diameter of the shaft is at least 9.7 mm but maximal 10.4 mm, wherein the guide channel for receiving instruments of one kind for the treatment of the abdomen and also separate instruments of another kind for fixing clips or elastic rings onto an internal organ is characterized with a diameter of 70–75% of the shaft diameter for receiving both kinds of instruments, and a second channel for receiving an optic having a diameter of 20–25% of the shaft diameter so that together the instrument channel and optic channel occupy about 95% of the internal diameter of said shaft.

4,392,486
COMBINATION VANITY SCREEN AND PATIENT SUPPORT COUCH EXTENSION

Bayard G. Gardineer, Skillman, and James A. Heringes, Dayton, both of N.J., assignors to Technicare Corporation, Solon, Ohio

Filed Aug. 26, 1981, Ser. No. 296,092
Int. Cl.³ A61F 5/00
U.S. Cl. 128—68 10 Claims



1. A combination vanity screen and patient support couch extension for use in combination with a primary patient support couch comprising:
a support panel having an upper transverse edge;
an extension panel having:
(i) a base section including a first transverse edge and a second transverse edge removed from said transverse edge and disposed in confronting relationship to said upper transverse edge of said support panel; and,
(ii) having a body section attached to said base section and

projecting beyond said second transverse edge and overlapping said support panel;

a hinge connecting said support panel upper transverse edge to said extension panel base section second transverse edge, said hinge permitting said extension panel to be rotated from a first position, in generally coplanar alignment with said support panel to act as a vanity screen, to an extension position generally transverse to said support panel in generally coplanar alignment with said primary patient support couch, to act as an extension therefor;

selectably engageable locking means cooperatively disposed on said support panel and said extension panel for locking said support and extension panels together in a generally coplanar alignment; and,

support means cooperatively disposed on said primary patient support couch and the first transverse edge of said extension panel for supporting said second panel in generally coplanar alignment with the patient support surface of said primary patient support couch.

4,392,487

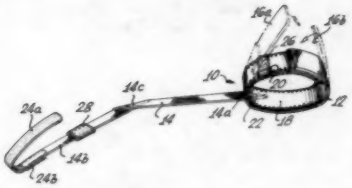
METHOD AND APPARATUS FOR FOOT STABILIZATION

Allen J. Selner, and Marc D. Selner, both of 13320 Riverside Dr. #216, both of Sherman Oaks, Calif. 91423

Filed Aug. 25, 1980, Ser. No. 180,811

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 H **11 Claims**



1. Apparatus for stabilizing the foot to control gait, comprising:

a sleeve formed from an elongated sheet of material having opposite ends that can be releasably fastened together, the opposite ends of said sheet being adjustable relative to one another upon fastening for adjusting the circumference of said sleeve, said sleeve having at least limited elasticity in the circumferential direction;

gripping means included on the inside surface of said sleeve for gripping the foot and anchoring said sleeve thereto;

an elongated strap connected at a first end to said sleeve; and

means for adjustably and releasably connecting a second end of said strap to said sleeve,

said sleeve being sufficiently inelastic in the lateral direction, and said strap being sufficiently inelastic in the longitudinal direction, to exert resistive forces to restrain the motions of the foot to prevent excessive pronation when said sleeve is fastened around and anchored to the foot at the mid part of the arch and when said strap is wrapped around the foot and tightened to said sleeve in a prescribed manner.

4,392,488

JOINT SPLINT

Peter Will, Wiener Strasse 78, 6100 Darmstadt, Fed. Rep. of Germany

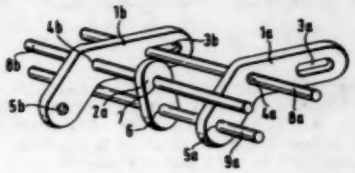
Filed May 26, 1981, Ser. No. 267,388

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020083

Int. Cl.³ A61F *3/00, 5/00*

U.S. Cl. 128—80 R **5 Claims**

1. A splint for the support of joints for orthopedic and surgical purposes, comprising: a chain of first, at least one intermediate, and last, obtusely angled bell cranks which are substantially identical replications, said bell cranks each having a fulcrum approximately at the intersection of first and second limbs, which limbs are oriented in like fashion along the length of said chain, with said first limbs of adjacent bell cranks overlapping and having, each separately, a slot therethrough adjacent the end distal from said fulcrum; each fulcrum, with the exception of that of said first bell crank, having an axle which is constrained to be guided within said slot of the overlapping



adjacent first limb; each said second limb, excepting that of said first bell crank, having one end of a crosslink pivotally connected adjacent the end distal from said fulcrum; the other end of said crosslink being pivotally connected to said axle of the preceding adjacent bell crank in said chain, such that when said first limbs are aligned said chain has a first length and when said first limbs are misaligned by flexing said chain, said chain changes to a second length; and attachment means connected to said first and last bell cranks for securing said splint on both sides of a joint in an extremity of a patient.

4,392,489

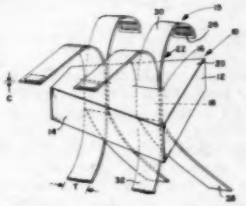
ABDUCTION PILLOW

Bill L. Wagner, Sr., Fullerton, Calif., assignor to Bio Clinic Company, San Bernardino, Calif.

Filed Jul. 15, 1981, Ser. No. 283,381

Int. Cl.³ A61F *5/37;* A47G *9/00*

U.S. Cl. 128—80 A **17 Claims**



1. In abduction apparatus including a resilient deformable pillow having a pair of generally oppositely facing elongated exterior surfaces skew to one another and means for retaining a leg of a human patient respectively against one of said outwardly facing surfaces so that the patient's leg is substantially laterally immovable independently of said pillow, the improvement comprising:

a. a passageway extending through said pillow in a direction generally parallel with said elongated exterior surfaces and perpendicular to the direction of elongation thereof;

b. elongated flexible binding means extending from respective ends of the passageway and having length in excess of length of said passageway by an amount sufficient for overlapping respective ends thereof around one leg of a patient contacting one of said elongated surfaces of said pillow, and having a central portion residing slidably within and frictionally engaged by said passageway, said binding means being slidably removeable from said pas-

sageway upon application to one end of said binding means of tensile force sufficient to overcome said frictional engagement of said binding means by said passageway;

c. pressure-sensitive fastening means at one end of said binding means;

d. receptor means at an end of said binder means remote said fastening means for holding said fastening means upon hand application of said fastening means against said receptor means;

wherein said binding means is resident within said passageway with binding means extremities extending from either end thereof.

4,392,490

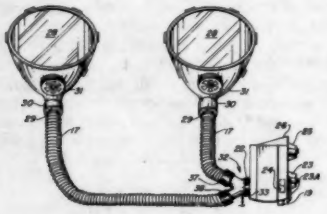
MULTIPLE OUTLET CONNECTING MEANS FOR SELF-CONTAINED POSITIVE PRESSURE OR DEMAND REGULATED BREATHING APPARATUS

Glen R. Mattingly, 950 E. Lockwood St., and Joseph A. Quintanares, 650 W. 1st Pl., both of Mesa, Ariz. 85201

Filed Feb. 23, 1981, Ser. No. 236,750

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—202.27 **2 Claims**



1. A control means for a self-contained breathing apparatus comprising:

means for receiving air under pressure from a pressure regulator,

said means comprising an inlet port and at least two outlet ports,

said inlet port comprising means for direct connection with an outlet port of said regulator,

each of said outlet ports of said control means comprising a connector means for connection with the end of a hose provided for transmitting air under pressure to a face mask of the breathing apparatus,

a detachably mounted plug removably connected to said connector means of one of said outlet ports of said control means for selectively closing the associated outlet port,

said outlet ports each comprising a cylinder extending outwardly thereof,

a plurality of holes extending around and through the periphery of each of the cylinders, and

said connector means being mounted on said control means at a point spaced from the end of the associated cylinder.

4,392,491

INJECTOR

Mitsuo Takasugi, Yokohama, and Ajoshio Okuyama, Tokyo, both of Japan, assignors to Colpo Company Limited, Tokyo, Japan

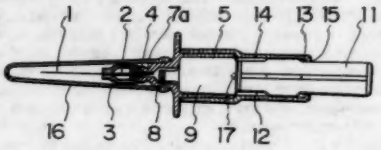
Filed Jul. 29, 1981, Ser. No. 288,198

Claims priority, application Japan, Aug. 5, 1980, 55-106806

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—202 **5 Claims**

1. An injector comprising an injection needle means, an injector tube comprising a neck portion and a hollow body portion open at the end thereof opposite said neck portion, said needle means being detachably secured to said neck portion of said injector tube, said hollow body portion of said injector tube being adapted to receive a cartridge on the interior of said body portion, a cylinder having a cylinder body portion coaxially positioned about said hollow body portion of said injector tube, the opposite end of said cylinder having a reduced diameter opening defining a stop, a piston having a piston head



engageable with the bottom of the cartridge, said piston being insertable in said cylinder at an end of said cylinder spaced from said opposite end of said cylinder, said piston having a stepped diameter which is restrained by said stop whereby to limit the movement of said piston when said stepped diameter of said piston engages said stop.

4,392,492

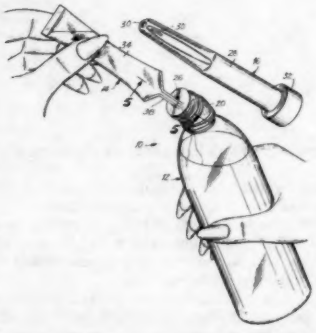
APPARATUS FOR STORING AND DISPENSING LIQUID DOUCHE

Ernest Pick, Cos Cob, Conn., assignor to The Purdue Frederick Company, Norwalk, Conn.

Filed Jul. 10, 1981, Ser. No. 282,254

Int. Cl.³ A61M *7/02*

U.S. Cl. 604—82 **12 Claims**



1. Disposable apparatus for storing and dispensing the constituents of a medicated douche solution, comprising:

a sealed bottle containing a predetermined amount of diluent, said bottle including a main axially extending portion and an integral substantially cylindrical connecting portion angularly extending from said main portion, said connecting portion being formed with a closure wall having means associated therewith for defining an opening therein having a diameter which is substantially equal to or less than a certain maximum value and which is substantially equal to or greater than a certain minimum value;

a sealed unitary packette formed of a vinylidene chloride copolymer material containing a unit dose of liquid douche concentrate, said packette including a container portion defining an interior volume in which said unit dose of liquid douche concentrate is contained and a dispenser portion integral with said container portion and being constituted by an elongated substantially tubular stem having a substantially constant transverse cross-section throughout its length whose major dimension equals said minimum value of said bottle opening diameter, said

tubular stem communicating at one end thereof with the interior of said container portion and having a separable integral terminal tip portion, said packette being openable through separation of said terminal tip portion from said dispenser portion, said tubular stem having a length greater than a certain value and an inner diameter smaller than a certain value such that upon opening said packette and inverting the same so that its open end faces downwardly, said tubular stem constitutes means for preventing the douche concentrate from freely flowing out of said packette under the effect of surface tension forces created between said stem and douche concentrate, said dispenser portion being insertable through said bottle opening so as to extend to a significant extent into the interior thereof so that the concentrate can be dispensed without spillage into the diluent by squeezing said container portion; and

an elongate nozzle having a connecting portion adapted to be connected to said connecting portion of said bottle after said concentrate has been dispensed into the diluent.

4,392,493

TATTOOING APPARATUS

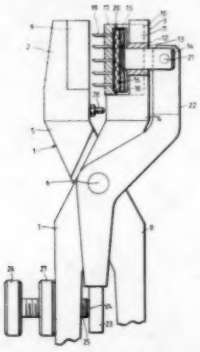
Halbe J. Niemeijer, Assen, Netherlands, assignor to Dawsonville Corp., N.V., Curacao, Netherlands Antilles

Filed Sep. 5, 1980, Ser. No. 184,462

Claims priority, application Netherlands, Sep. 6, 1979, 7906689

Int. Cl.³ A61D *7/00*

U.S. Cl. 128—316 **35 Claims**



21. An exchangeable, marking symbol program carrier for animal tattooing apparatus having a plurality of hollow needles arranged in a matrix capable of forming marking symbols from combinations of selected ones of said needles and having an operating means for inserting needles in the tissue of the animal to be marked and injecting contrasting fluid therein, said program carrier comprising:

a member exchangeably mountable in the apparatus and having a plurality of fluid channels arranged in a marking symbol pattern and forming an animal marking symbol, each of said fluid channels being separately alignable with one of said selected ones of the needles when the program carrier is mounted in the apparatus for providing a fluid path for the contrasting fluid to the selected ones of the needles; and

a reservior for the contrasting fluid formed as an integral unit with said member for providing contrasting fluid to said fluid channels of said member.

4,392,494

LIGATURE TYING INSTRUMENT

Richard L. Ashby, 290 Crestmont Dr., Oakland, Calif. 94619

Continuation-in-part of Ser. No. 12,004, Feb. 14, 1979, abandoned. This application Apr. 2, 1981, Ser. No. 250,104

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—326 **5 Claims**

1. An improvement in ligature tying instrument comprising a hemostat-like plier in which grasping jaw members are flexibly pivoted together intermediate their ends; means for releasably securing said jaws in grasping position on a ligature wire;

wherein the improvement comprises a balanced and substantially symmetrical instrument having one handle member extended as a polygonal rod rigidly fixed in the long axis of the instrument for purposes of spinning the instrument about a longitudinal centerline, when said instrument is locked in the grasping position;

wherein the grasping face of the jaw members is concave except right at the tip, such that closure of the jaws tends to force the grasped wires toward the long axis of the instrument for purposes of centering the wires and maintaining their central position during the twisting, tucking and breaking process.

4,392,495

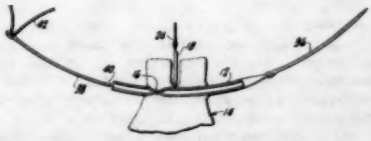
APPARATUS FOR AND METHOD OF SUTURING TISSUE

Jon. H. Bayers, 2935 Bechelli Ln., Suite C, Redding Calif. 96001

Filed Aug. 31, 1981, Ser. No. 298,030

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R **7 Claims**



1. A method of suturing severed tissue comprising:

a. passing a first flexible, tubular suture through the tissue;

b. collapsing at least a portion of said flexible, tubular suture;

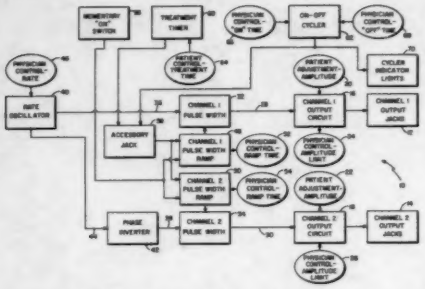
c. simultaneously opening said collapsed portion of said first, flexible, tubular suture and introducing a second suture through said first, flexible, tubular suture; and

d. fastening said second suture in relation to the tissue.

4,392,496
NEUROMUSCULAR STIMULATOR

David J. Stanton, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 13, 1981, Ser. No. 243,558
Int. Cl.³ A61N 1/36
U.S. Cl. 128—423 W 12 Claims



1. A muscle stimulator comprising, in combination:
oscillator means for producing a periodic output signal at a predetermined repetition rate;
rate control means coupled to said oscillator means for altering the repetition rate of said oscillator means;
inverter means, coupled to receive the output of said oscillator means, for producing a periodic output signal having a polarity opposite to that of the periodic output signal produced by said oscillator means;
treatment timer means for generating a first logic signal after a predetermined treatment time interval;
treatment timer control means coupled to said treatment timer means for establishing the predetermined treatment time of said treatment timer means;
cycler means for repetitively producing a second logic signal which remains at a first logic level for a predetermined "on" time interval and a second logic level for a predetermined "off" time interval;
first cycler control means completed to said cycler means for setting the predetermined "on" time interval of said cycler means;
second cycler control means coupled to said cycler means for setting the predetermined "off" time interval of said cycler means;
external switch means;
plug means operatively connected to said external switch means;
accessory jack means constructed and arranged for receiving said plug means and for providing a third logic signal when said plug means is inserted in said jack means and said external switch means is in a particular condition or when said plug is not inserted in said jack;
momentary contact switch means for producing a fourth logic signal when said momentary on switch means is actuated;
first and second ramp generator circuit means connected to receive said first, second, third and fourth logic signals and for producing first and second output ramp signals changing from a first to a second level at first and second predetermined rates, subsequent to receipt of either of said first, second, third or fourth logic signals;
first and second ramp generator control means coupled respectively to said first and second ramp generator circuit means for independently altering the rate of change of the output ramp signals of said first and second ramp generator circuit means;
first pulse width circuit means coupled to receive the ramp signal from said first ramp generator circuit means and to receive the periodic output signal from said oscillator means and for producing a fixed amplitude pulse signal having a pulse width increasing at a rate proportional to the rate of change of the ramp signal from said first ramp generator circuit means at the predetermined repetition rate of said oscillator means until the output signal of said second ramp generator circuit means reaches the second level and the pulse width of the pulse signal reaches a predetermined pulse width;
second pulse width circuit means coupled to receive the ramp signal from said second ramp generator circuit means and to receive the inverted periodic output signal of said inverter means and for producing a fixed amplitude pulse signal having a pulse width increasing at the rate of change of said ramp from said second ramp generator circuit means at the predetermined repetition rate of said oscillator means until the output signal of said second ramp generator circuit means reaches the second level and the pulse width of the pulse signal reaches a predetermined pulse width;
first and second output circuit means connected to receive the pulse outputs of said first and second pulse width circuit means respectively and for producing a balanced biphasic constant current output signal; and
first and second output circuit control means for adjusting the current amplitude of the output pulses of said first and second output circuits respectively.

4,392,497
ERYTHROCYTE SEDIMENTATION RATE APPARATUS AND METHOD

Rahmat U. Ghaussy, 15300 W. Nine Mile Rd., Southfield, Mich. 48075

Filed Dec. 2, 1980, Ser. No. 212,134
Int. Cl.³ G01N 33/48
U.S. Cl. 128—637 7 Claims

1. Erthrocyte sedimentation rate apparatus for use with a direct flow needle assembly having a hollow tubular body including a smooth cylindrical first bore opening through one end of the body, and an elongated hollow tubular needle mounted in fixed position at the other end of the body and extending through said other end and coaxially into said first bore, the needle having one sharp end exposed within said bore and another sharp end exposed externally of said body, said erythrocyte sedimentation rate apparatus comprising an axially elongated transparent generally cylindrical ESR specimen tube having a main body portion and a diametrically enlarged portion at one end, said tube having a generally cylindrical blind second bore opening through said one end, said main body portion having a uniform interior cross section throughout its length, a penetrable elastomeric stopper received within said one end and sealing said tube, said cylindrical stopper

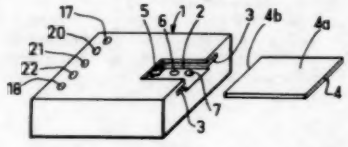
having an integral diametrically enlarged and generally cylindrical flange exposed externally of said tube and projecting beyond the periphery of said tube, said flange having a diameter substantially equal to the diameter of said first bore, the space within said tube being substantially evacuated, and rack means for supporting said ESR specimen tube in axially vertical position and having a horizontally disposed base and a panel supported on and extending vertically upwardly from said base, a clip mounted on said panel for engaging and releasably retaining said main body portion, and an upwardly opening generally cylindrical aperture in said base in axially vertical alignment with said clip, said aperture having a diameter substantially equal to the diameter of said cylindrical flange.

4,392,498

APPARATUS INTENDED FOR CLASSIFYING THE QUANTITY OF A FATTY PRODUCT FOUND ON THE SKIN SURFACE

Jean-Luc M. Leveque, Montfermeil, and Gilbert J. Gras, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France

Filed Apr. 8, 1981, Ser. No. 252,489
Claims priority, application France, Apr. 9, 1980, 80 07961
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—665 **14 Claims**



1. Apparatus for the classification of the skin of a living subject into n predetermined classes where n is an integer greater than one, the said classification being effected according to the quantity of fatty product carried by the said skin, such apparatus comprising:

(a) a translucent element having two surfaces of which one surface is to be applied under predetermined conditions on skin to be examined;

(b) frame means to hold said translucent element in a predetermined position;

(c) a luminous flux emitter arranged to irradiate said translucent element in said predetermined position;

(d) a luminous flux receiver positioned to receive luminous flux from said irradiated translucent element in said predetermined position;

(e) means for supplying (n−1) predetermined threshold voltage values;

(f) means for comparing the output of the flux receiver with said (n−1) predetermined voltage values; and

(g) display means responsive to said comparing means to produce display of at least one of n possible luminous indications representing the said n classes.

4,392,499

ADAPTOR FOR FACILITATING BLOOD SAMPLING PROCEDURES

Eric R. Towse, 647 74 St., Brooklyn, N.Y. 11209

Continuation of Ser. No. 50,601, Jun. 21, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,261
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—764 **6 Claims**

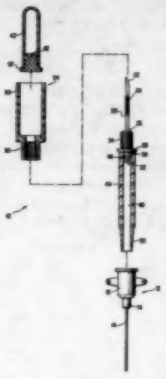
1. Apparatus for facilitating both intravenous and blood-sampling procedures, comprising:

evacuated tube means for collecting a blood sample;

needle means operatively connected with said tube means for supplying said blood sample thereto;

an adaptor releasably connected with said needle means for transferring said blood sample from a catheter to said needle means; and

a flexible intravenous catheter having a socket means integrally bound therewith, said socket means constructed to separably receive said adaptor to form a temporary connection with said catheter so as to be able to withdraw blood from a mammalian blood vessel and said socket



means being readily connectable to a source of intravenous fluid when said adaptor is not connected to said catheter;

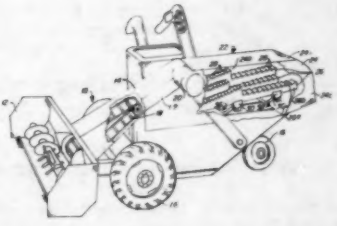
whereby said catheter may be utilized to perform both said blood-sampling and intravenous-feeding procedures without removing said catheter from a blood vessel such that intravenous feeding takes place at the blood-sampling site.

4,392,500

GRAIN COMBINE WITH IMPROVED STRAW WALKER

Howard E. Houle, 720 Adams St., Anoka, Minn. 55303

Filed Jul. 6, 1981, Ser. No. 280,443
Int. Cl.³ A01F *12/30*
U.S. Cl. 130—26 **5 Claims**



1. A straw walker for a grain combine comprising in combination a housing having a top and side walls, a plurality of parallel generally horizontally disposed straw walkers each having parallel side walls and upwardly directed teeth facing the same direction for carrying straw longitudinally through the housing, a plurality of parallel substantially identical crank shafts mounted for rotation upon the grain combine below the straw walker and generally at right angles thereto each crank shaft having the same number of throws, bearings on the lower aspect of each of the straw walkers and each of the bearings being mounted upon one throw of the crank shaft adjacent thereto, each of the crank shafts is built up from separate pieces comprising a plurality of parallel crank arms bored at each end to receive a crank throw pin or crank shaft pin, the latter being journaled for rotation upon said grain combine and said crank

throw pins being journaled within the bearings on the straw walkers, fasteners securing the pins rigidly within the bores in the crank arms, said fasteners comprise fastener means establishing the angular orientation between the pins and the crank arms to precisely position the throws at uniformly spaced locations and retaining means secured between the arms and the pins locking the pins in position, synchronizing drive means connected between the crank shafts for rotating the crank shafts in the same direction and at the same speed and motive power means operatively connected to the crank shafts for imparting rotation thereto.

4,392,501

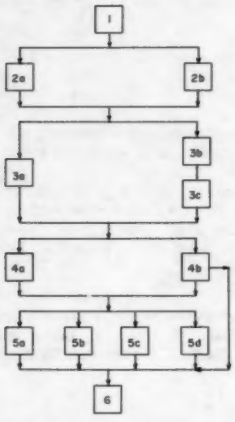
METHOD OF PROCESSING FRESH TOBACCO LEAVES

Richard P. Newton, Prospect; Patrick H. Harper, Louisville, both of Ky.; Vernon L. Geiss, Georgetown, Ind., and John N. Jewell, Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 6, 1981, Ser. No. 280,189

Int. Cl.³ A24B *3/00, 3/18, 3/10, 7/00*

U.S. Cl. 131—300 **11 Claims**



1. A method for processing freshly harvested tobacco having from 65% to 90% moisture comprising the steps of:

(a) reducing the particle size of the harvested tobacco into a preselected size; and

(b) drying the tobacco, said steps being completed without the natural curing of the tobacco.

4,392,502

INTERNAL COMBUSTION ENGINE THROTTLE CONTROL

Paul Weston, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

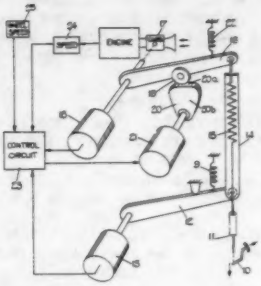
Filed Jan. 28, 1981, Ser. No. 229,384

Claims priority, application United Kingdom, Jan. 30, 1980, 8003183

Int. Cl.³ F02D *9/00;* **B60K** *31/00*

U.S. Cl. 123—342 **12 Claims**

1. An internal combustion engine throttle control comprising an accelerator pedal, a butterfly valve and linkage means connecting the accelerator pedal to the butterfly valve and including a first movable member coupled to the accelerator pedal, a second movable member coupled to the butterfly valve, first spring means connecting the first movable member to the second movable member whereby depression of the accelerator stresses said first spring means to tend to open the butterfly valve, mechanical limit means restricting relative motion of the ends of said first spring means as said first spring means is relaxed, second spring means acting to urge the butterfly valve towards a closed position, whereby lifting of the drivers foot from the accelerator pedal causes relaxing of said first spring means to the limit permitted by said limit means and movement of the butterfly valve to its closed position by said second spring means, a cam, cam follower mean mounted on said second movable member and urged into engagement with said cam by the action of said first spring means so as to limit



opening of the butterfly valve in accordance with the position of said cam, a servo-motor drivingly connected to said cam, and said cam being shaped to provide a desired non-linear relationship between butterfly valve opening and displacement of the cam by the servo-motor, and control means for the servo-motor operating to displace the cam to a position dependent on at least one vehicle operating parameter.

4,392,503

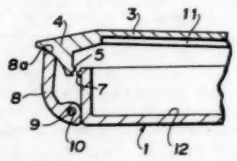
VANITY CASE

Nobuhisa Watanabe, Sekimachi, Japan, assignor to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,953

Int. Cl.³ A45D *33/00*

U.S. Cl. 132—83 R **5 Claims**



1. A synthetic resin-made vanity case comprising;

a receptacle member for containing a cosmetic material;

a cover member hinged with said receptacle member at the rear end thereof;

a first latching member integrally formed with said cover member;

a second latching member integrally formed with said receptacle member for engagement with said first latching member by snap action when said receptacle member is closed by said cover member; and

an unlatch member disposed in either one of said receptacle member and said cover member;

wherein said unlatch member is housed in a recess substantially of rectangle formed in a marginal portion of either one of said cover member and said receptacle member; said unlatch member has its one end formed as a free end extending upwardly and the other end retained in said recess; and the free end of said unlatch member is arranged to lie closely adjacent to a marginal portion of the other of said receptacle member and said cover member in the position of said receptacle member being closed and

also arranged to move inwardly about the other end of said unlatch member to apply force in a direction in which to separate said cover member from said receptacle member, thereby releasing the engagement of between said first and second latching member when said unlatch member is pushed inwardly.

4,392,504

STACKING CYLINDER FOR USE IN A COIN HANDLING MACHINE

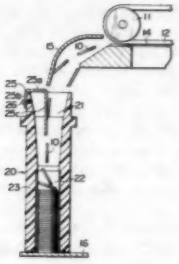
Hideshi Sentoku, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1980, Ser. No. 165,718

Claims priority, application Japan, Jul. 6, 1979, 54-93801[U]; Jul. 6, 1979, 54-93802[U]

Int. Cl.³ G07D 9/06

U.S. Cl. 133—1 A **4 Claims**



1. A stacking cylinder for use in a coin handling machine wherein coins are introduced into the stacking cylinder and stacked therein, said stacking cylinder comprising:

a cylinder body having a cylindrical recess formed therein; and

a resilient metal sheet rolled into generally cylindrical form and inserted into the cylindrical recess formed inside the cylinder body, the rolled sheet being rigidly retained within the recess due to resiliency of the metal sheet so that coins are movable into and out of said stacking cylinder past said rolled sheet, said resilient metal sheet having a chevron shaped edge positioned inside the rolled sheet.

4,392,505

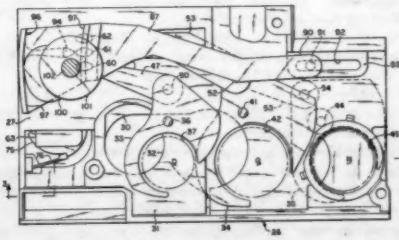
COIN PAYOUT ASSEMBLY

Robert T. Maloney, Creve Coeur, and Carl L. Vogt, St. Louis, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.

Filed Dec. 3, 1980, Ser. No. 212,273

Int. Cl.³ G07D 9/04

U.S. Cl. 133—4 A **11 Claims**



1. A coin payout assembly, comprising:

(a) a plurality of coin-handling means, each coin-handling means being movable to a first position for receiving a coin and to a second position for discharging the coin,

(b) coin-selecting means operatively connected to each coin-handling means,

(c) coin-selecting means operatively and selectively connected to the coin-actuating means and to each of the coin-handling means,

(d) drive means operatively connected to the coin selecting means and selectively connected to the coin-actuating means for moving each coin-handling means to the first and second position,

(e) the coin-actuating means including:

1. a plurality of actuating arms, each actuating arm being operatively connected to one of the coin-handling means, and

2. guide means engaging and guiding each of the actuating arms,

(f) the drive means selectively engages each of the actuating arms for moving the arm and its associated coin-handling means,

(g) each of the actuating arms including a guide pin,

(h) the guide means including a plurality of guide slots, each guide slot receiving the guide pin of one of the actuating arms, and

(i) the drive means including a drive link selectively connectible with any one of the actuating arms by the coin-selecting means, the drive means moving the drive link and the selectively connectible actuating arm for moving the associated coin-handling means.

4,392,506

APPARATUS FOR CONVEYING TUBULAR MATERIALS IN PICKLING FACILITIES OF THE SAME

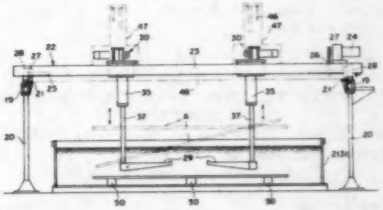
Yoshiro Tanaka; Hayato Moroi; Yukihiko Komatsu; Kazuo Akagi; Ryujiro Shitamatsu, all of Shimonoseki, and Tadashi Nishimura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 1, 1981, Ser. No. 307,670

Claims priority, application Japan, Aug. 12, 1981, 56-120155[U]

Int. Cl.³ B08B 3/04

U.S. Cl. 134—46 **11 Claims**



1. An apparatus for conveying tubular members in pickling facilities for the same, said pickling facilities including a plurality of treatment liquid tanks disposed in series, said apparatus comprising:

a pair of guide rails arranged respectively in the direction of the arrangement of the tanks and along corresponding sides of the tanks;

a travelling car reciprocably disposed on the guide rails;

at least one pair of tube-supporting hooks mounted on the travelling car and spaced in the widthwise direction relative to the guide rails;

elevating means operatively connected with the travelling car for moving each of the tube-supporting hooks upwardly and downwardly;

swivel drive means operatively connected with the travelling car for turning each of the tube-supporting hooks between a position parallel to the lengthwise direction of

the rails and a position perpendicular to the lengthwise direction of the rails;

a horizontal position detector for stopping and starting the travelling car at a position corresponding to each of the treatment liquid tanks;

a vertical position detector for sensing the position of each of the tube-supporting hooks at locations both below and above the liquid level in each of the treatment liquid tanks; and

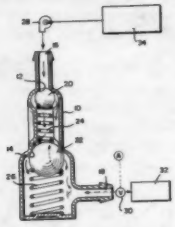
means for interlockingly connecting the vertical position detector and said elevating means.

4,392,507

TWO-STAGE PRESSURE RELIEF VALVE

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed May 15, 1981, Ser. No. 263,918
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—38 **3 Claims**



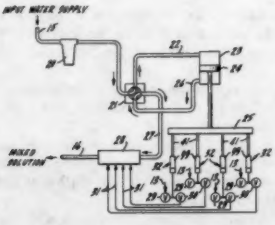
1. A two-stage valve adapted for use in a vehicle fuel line to provide protection against discharge of fuel during and after roll-over, comprising a housing with inlet and outlet openings in the upper and lower portions of the housing as disposed for normal operation, two axially disposed ball check valves within the housing having their seats facing in the direction of the outlet opening, the lower ball being loaded upward toward its seat with an expansion-biased spring, the upper ball being loaded upward toward its seat by an expansion-biased spring resting upon the lower ball, the lower ball being larger than the upper ball and the upper spring having a lower spring force than the lower spring.

4,392,508

PROPORTIONAL MIXING SYSTEM WITH WATER MOTOR DRIVE

Thomas G. Switall, Wheeling, Ill., assignor to Ryco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed Apr. 15, 1981, Ser. No. 254,446
Int. Cl.³ F16K *19/00*
U.S. Cl. 137—99 **7 Claims**



1. A proportional mixing system with liquid motor drive comprising

a reversing switch and valve assembly having a reversing switch means alternately movable from a first position to a second position, said reversing switch means including a reciprocating reversing member, shift means associated with said reversing member and movable thereby, and valve means including a reversing vane operatively connected to said reversing switch means capable of moving from a first position to a second position, said reversing vane linked to said shift means and being rotatable through a limited arc, said valve means including opposite port means, said valve means reversing vane being movable in response to said reversing switch means to alternately open and close said opposite port means, said valve means further including a liquid inlet and outlet opening to said reversing vane,

said shift means comprising a hollow, spring retainer structure and opposite keeper means, said reversing switch means including latching and releasing means adapted to alternately catch and release opposite keeper means, said reversing member movable back and forth through said shift means and capable of driving said shift means in a reciprocating path, opposite trip means carried on said reversing member and positioned to contact and alternately move opposite latching and releasing means, and spring shifter means retained within said spring retainer structure and positioned for compression contact by opposite trip means, said spring shifter capable of alternately compressing and releasing at contact a trip means with a latching and releasing means to drive said shift means to an opposite position for latch engagement by an opposite keeper means,

a liquid motor associated with said reversing switch and valve assembly and having a piston cylinder opening at opposite sides to said valve port means, a main piston movable within said cylinder, and a main piston shaft secured to said main piston movable therewith,

actuating arm means linking said main piston shaft and said reversing member whereby said reversing member moves in response to main piston shaft motion,

at least one metering pump actuated by movement of said main piston shaft and being linked thereto by pump ram arm means, said metering pump having a piston rod,

whereby volumes of first liquid will be siphoned and pumped therethrough in predetermined quantities and said system will be automatically driven by the first liquid entering the said inlet of said valve means and introduced to alternate sides of said liquid motor piston with said liquid being alternately expunged at the opposite port means to subsequently exit the valve means at said outlet opening, and said expunged first liquid and a second liquid pumped by said metering pump in predetermined proportions can be directed to be subsequently mixed.

4,392,509

FURNACE VALVE

Michael Siddall, Pooraka, Australia, assignor to Sidchrome (S.E. Asia) Limited, Hong Kong

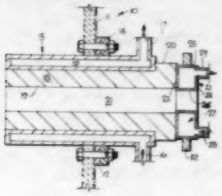
Filed May 19, 1980, Ser. No. 151,473
Claims priority, application Australia, May 23, 1979, PD8920
Int. Cl.³ F16K *49/00*
U.S. Cl. 137—340 **8 Claims**

1. A valve for controlling the rate of discharge of a melt from a furnace, comprising:

a water cooled sleeve having an inner tubular wall and an outer wall, a water cooling space between the inner and outer walls, and conduit connection means forming inlet and outlet ports to said water cooling space,

a carbon member carried by the sleeve and having a flow passage extending therethrough, said carbon member being a liner having a stem portion which is contained within the sleeve and an enlarged head which abuts the

outer end of the sleeve and forms substantially the terminal end of the flow passage, and



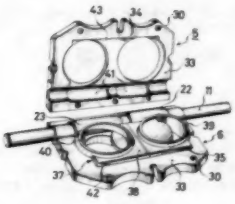
a shutter, and guide means controlling the shutter for movement across the outer face of said enlarged head to control the effective discharge area of said flow passage.

4,392,510

CONTROL VALVE FOR VISCOUS MATERIAL PUMPS

Horst Heckmann, Sprockhövel, and Werner Nawroth, Waltrop, both of Fed. Rep. of Germany, assignors to Friedrich W. Schwing, GmbH, Herne, Fed. Rep. of Germany

Continuation of Ser. No. 236,568, Feb. 20, 1981, abandoned.
This application Sep. 30, 1982, Ser. No. 429,020
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006542
Int. Cl.³ F16K *27/04, 3/00*
U.S. Cl. 137—454.2 **5 Claims**



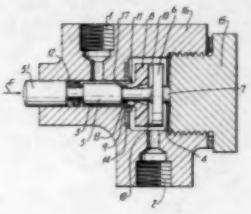
1. A control valve for viscous material pumps comprising:
a flat housing (2) having a pair of generally parallel exterior surfaces, said housing having a pair of laterally spaced viscous material channels (3, 4) extending therethrough normal to said exterior surfaces, said housing being formed of two parts (5, 6) abutting along a joinder plane lying parallel to said exterior surfaces;
a valve slide in said housing having a valve plate (10) fastened to valve rod (11) for reciprocal movement within said housing across one or the other of said channels for controlling the movement of material through said channels; and
a wear shell (9) mounted in said valve housing and containing said valve plate with said valve rod extending therefrom, said wear shell being formed of a pair of generally similar halves (7, 8) divided along a central plane (46) lying normal to the movement of said valve slide, said wear shell halves being assemblable to form said wear shell by threading them on opposite ends of said valve rod (11), said wear shell being formed for permitting the reciprocal movement of said valve slide and having a pair of openings aligned with said channels, said wear shell being retained in said housing by locking engagement with the interior of said housing and having annular projections (39, 40) around said openings extending into said channels (3, 4) for lining same.

4,392,511

PRESSURE REGULATOR

Bernd Schopper, Frankfurt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 121,548, Feb. 14, 1980, abandoned.
This application Jul. 10, 1981, Ser. No. 282,292
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911886
Int. Cl.³ F16K *17/26*
U.S. Cl. 137—493.2 **23 Claims**



1. A pressure regulator comprising:
a housing;
an inlet chamber disposed in said housing;
an outlet chamber disposed in said housing;
a plunger valve disposed in said housing; between said inlet chamber and said outlet chamber, said plunger valve being opened when input pressure is lower than a predetermined switching pressure and being closed against an opening force when the pressure in said outlet chamber exceeds said switching pressure;
a non-return valve disposed in said housing which opens against a closing force when a pressure reduction in said inlet chamber relative to the pressure in said outlet chamber occurs, said non-return valve being in the form of a sealing lip disposed on a movable part of said plunger valve in a manner such that when said plunger valve is closed said sealing lip is situated in said inlet chamber and closes a channel which leads through a valve plunger and a valve body of said plunger valve to said outlet chamber; and
a sealing plate fastened to said valve body annularly enclosing said valve plunger, said sealing plate cooperating with an annular valve seat disposed between said inlet and outlet chambers in a recess of said housing, said annular valve seat being an interchangeable insert disposed in said recess.

4,392,512

RELIEF VALVE

Bruce K. Kreeley, Bristol, Pa., assignor to The Singer Company, Stamford, Conn.

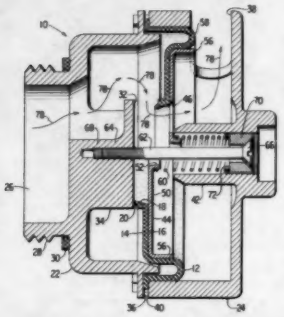
Filed Jun. 3, 1981, Ser. No. 270,167
Int. Cl.³ F16K *17/06*
U.S. Cl. 137—496 **5 Claims**

1. A gas pressure relief valve comprising:
a resilient diaphragm having a first side, a second side, and a central opening, said diaphragm being formed with an annular sealing lip about the central opening on the first side thereof;
a body member including a central seat, an inlet to a source of gas to be pressure relieved, and a continuous shoulder adapted to contact the periphery of the first side of said diaphragm;
a top member including an outlet for relieved gas and a continuous shoulder adapted to contact the periphery of the second side of said diaphragm opposite the shoulder of said body member;
means for connecting said body member to said top member so that the periphery of said diaphragm is maintained

sealingly engaged between the shoulders of said body and top members;

a plate having a central opening, said plate being disposed adjacent the second side of said diaphragm with the central opening of the plate being aligned with the central opening of the diaphragm; and

a compression spring positioned intermediate said plate and said top member to provide a biasing force to said diaphragm through said plate to force said sealing lip in sealing engagement with said seat, said biasing force being sufficient so that said sealing lip remains sealingly engaged



with said seat when the gas pressure at the inlet is below a predetermined value;

said compression spring being helically wound, said plate being formed with an island region in its central opening connected to the plate by relatively slender spokes which do not substantially block said central opening, said island region having an upstanding wall on the side of the plate opposite the side disposed adjacent said diaphragm, a first end of said spring being fitted around said wall, said top member being formed with an internal hollow cylindrical projection, and the second end of said spring being fitted inside said projection.

4,392,513

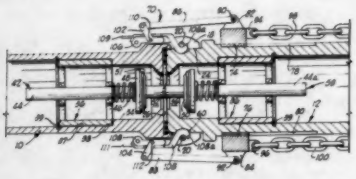
QUICK DISCONNECT SAFETY COUPLING

Reuel C. Parrish, P.O. Box 1846, Enid, Okla. 73701

Filed Feb. 9, 1981, Ser. No. 232,837

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.01 **13 Claims**



1. A quick disconnect safety coupling comprising:

an open-ended female tubular section having radial openings through the wall thereof adjacent its open end;

cam lever pins on the female section adjacent the openings;

a tubular male section sealingly engageable with the female section and having a cam groove in the outer periphery thereof positioned for alignment with said openings when the male and female sections are engaged;

valve means in said sections for closing each of said sections when the sections are disengaged from each other, and opening the sections to fluid flow through both sections when the sections are engaged; and

a quick disconnect latching subassembly on the male section and releasably engaging the cam lever pins and cam grooves, said latching subassembly including:

axially slidable means mounted on said male section for axial movement on said male section toward and away from said female section; and

link means extending from said axially slidable means to a location adjacent said cam lever pins, said link means comprising:

a pull link pivotally connected to said ring;

a crank link pivotally connected to said pull link; and

a cam lever having a first end pivotally connected to the crank link and a second end releasably connected to one of said cam lever pins and engaging said cam groove.

4,392,514

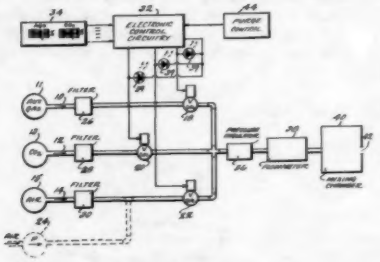
APPARATUS AND METHOD FOR PRECISION GAS MIXING

Max F. Farley, Marietta, and Laughton T. Fine, Cincinnati, both of Ohio, assignors to Queue Systems, Inc., Parkersburg, W. Va.

Filed Jan. 26, 1981, Ser. No. 228,199

Int. Cl.³ G05D *11/13*

U.S. Cl. 137—624.2 **22 Claims**



1. A precision gas mixing apparatus of the type which mixes plural gases in desired proportions by sequentially permitting each gas to flow for selected time durations, which time durations are related to such desired proportions, said system comprising:

plural nonpressure-regulated input gas flow lines, each having an electrically controllable on/off flow control device connected in series therewith; and

a gas flow rate control means including a serially connected gas pressure regulator and gas flowmeter fluid connected in common to each of said on/off flow control devices for supplying any one of said plural gases at a desired preset gas flow rate whenever the respectively corresponding on/off flow control device is turned on.

4,392,515

WEAVING LOOM WITH A WAVING SHED HAVING AN IMPROVED FRAME

Albert Moessinger, Vaud, Switzerland

Filed Feb. 20, 1981, Ser. No. 236,237

Claims priority, application France, Feb. 21, 1980, 80 04125

Int. Cl.³ D03C *13/00*; D03D *47/26*

U.S. Cl. 139—55.1 **13 Claims**

1. A weaving loom having a waving shed comprising:

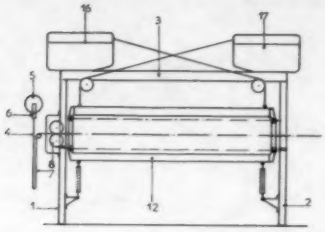
propelling means for introducing and propelling a weft thread into the shed wherein the weft thread is inserted by unwinding a specific length of thread from one side of the loom;

a plurality of frame means wherein each frame means includes:

a width to extend throughout the width of a cloth to be woven,

heddle holder rods, bars, and supports wherein the opposite ends of said bars are moveably connected to opposite ends of said supports at points aligned with the axes of said heddle holder rods;

stationary guides adapted to direct said supports in their



reciprocating cycle to restrict lateral motion of each frame;

controls adapted to permit each end of each frame to proceed through its reciprocating cycle independantly of the opposite end; and

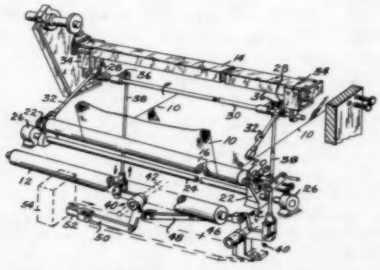
a reed for pushing each pick of inserted weft thread.

4,392,516

DRIVE FOR LOOM EASER BAR

Douglas D. Goodnough, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 4, 1981, Ser. No. 270,552
Int. Cl.³ D03D *49/00*; D03C *7/00*
U.S. Cl. 139—115 **5 Claims**



1. In a weaving machine having a frame, a top leno warp beam and a bottom ground warp beam, and a positive-motion dobby, the combination comprising:

easer-beam means overlying the top beam warp threads at the juncture of their vertical and their horizontal run;

crank arm means mounting said easer-bar means to the frame for rocking movement toward and away from the top beam warp threads to respectively increase and decrease the tension in the top beam warp threads; and

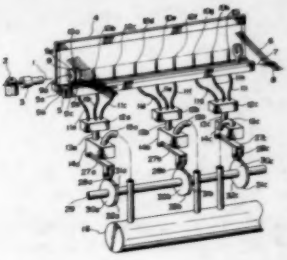
mechanical means devoid of spring means mounted to the frame and connecting said easer-bar mounting means to the dobby for positively rocking said easer bar toward and away from the top beam warp threads in response to predetermined movements of the dobby.

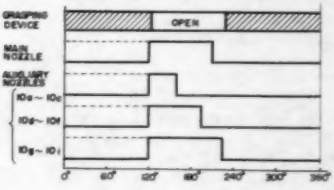
4,392,517

WEFT PICKING METHOD AND DEVICE FOR CARRYING OUT SAME

Takao Takahashi, Hachioji, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1980, Ser. No. 218,325
Claims priority, application Japan, Dec. 26, 1979, 54-168171
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **12 Claims**





1. A method of weft picking in an air jet loom of the type wherein a weft yarn projected by an air jet from a weft inserting nozzle is carried through a weft guide channel to pick the weft yarn into the shed of warp yarns by air jets from a plurality of auxiliary nozzles, said method comprising the steps of:

controlling the ejection of air jets from said auxiliary nozzles in a manner to simultaneously commence the air jet ejections from all said auxiliary nozzles prior to the time the weft yarn from said weft inserting nozzle reaches the auxiliary nozzle closest to said weft inserting nozzle, maintaining the air jet ejections from all said auxiliary nozzles for a selected time interval, and thereafter successively stopping the air jet ejections from the respective auxiliary nozzles in the order of the weft yarn passing by said auxiliary nozzles.

4,392,518

FENCE WIRE WINDER

Ivan H. Stant, 2003 Indiana Ave., Connersville, Ind. 47331

Filed May 15, 1981, Ser. No. 264,120
Int. Cl.³ B21F *7/00*
U.S. Cl. 140—119 **4 Claims**

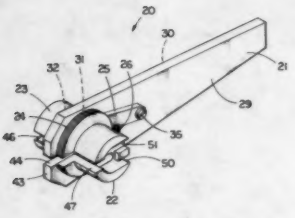
1. A fence wire winder for twisting together two strands of wire comprises:

a single-piece handle member having two opposing surfaces and defining a clearance aperture therethrough;

a wire-receiving spindle member extending through said clearance aperture such that a different portion of said spindle member outwardly extends from each of said two opposing surfaces of the handle member, said spindle member defining a circumferential groove and including a longitudinal wire-receiving channel and a transverse wire-receiving channel;

first means for retaining said spindle member within said

clearance aperture while permitting rotation of said handle member relative to said spindle member said first means including a flat washer of a "C" configuration having its interior edges cooperatively disposed about said circumferential groove in said spindle and a retaining thimble placed over and secured to the end of said spindle member and extending over said flat washer; and



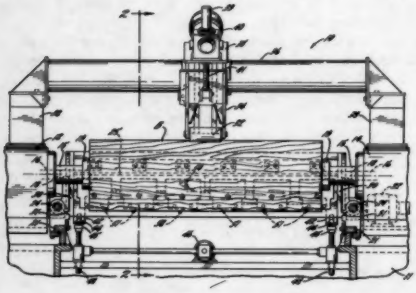
second means disposed on one side of said handle member for locking said handle member to said spindle member when said handle member is turned in a first direction of rotation and for permitting free turning of said handle member relative to said spindle member when said handle member is turned in a second direction of rotation which is opposite to said first direction of rotation.

4,392,519

KNIFE PITCH CONTROL FOR VENEER LATHE

Harry B. Calvert, Longwood, Fla., assignor to Calvert Manufacturing, Inc., Longwood, Fla.

Filed Feb. 5, 1981, Ser. No. 231,872
Int. Cl.³ B27L *5/02*
U.S. Cl. 144—212 **12 Claims**



1. In a veneer lathe having power spindle means for rotating a wood block on the spindle axis, a knife carriage disposed for movement transversely of said spindle axis, and a backup roll positioned in timed relation with the knife carriage, the combination comprising:

(a) A knife support rockably mounted on said carriage;

(b) a knife carried by said support for movement laterally of the spindle axis;

(c) means for clamping said knife in said support;

(d) means defining a laterally unsupported portion of said knife intermediate the ends thereof;

(e) sensor means disposed in engagement with the unsupported portion of the knife for sensing the lateral deflection thereof; and

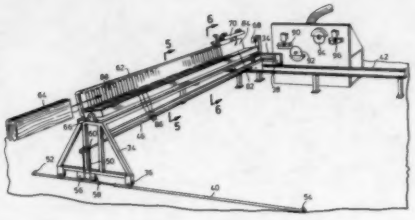
(f) said sensor means being adapted to generate a signal corresponding to said lateral deflection in amplitude and direction.

4,392,520

LOG BUILDING CONSTRUCTION

Ronald A. Wrightman, P.O. Box 268, Minden, Ontario, Canada K0M 2K0

Filed Mar. 13, 1981, Ser. No. 243,516
Int. Cl.³ B27B *1/02*
U.S. Cl. 144—363 **5 Claims**



4. A method of notching the end of a log at an upper edge and at a lower edge to make a dove-tail formation for a log building by the steps of:

projecting the log longitudinally of itself onto a cradle, and arresting the projection of the log to cause a free end of the log to project a predetermined amount beyond the cradle;

clamping the log so positioned in the cradle;

moving the cradle in a direction transversely of the direction of the longitudinal axis of the log for operative engagement by four saw blades which are mounted in predetermined relation to the path of the cradle to notch the upper edge of the log and the lower edge of the log whereby to form a dove-tail configuration;

each of the notches being defined by a side formed by a transverse cut and by a side formed by a longitudinal cut that intersects the transverse cut at a corner;

the corner of one notch being inclined a predetermined angle to the corner of the other notch and said log being rotated about its longitudinal axis through said predetermined angle between making the transverse cut of one notch and making the transverse cut of the other notch to incline the corners of said notches at said predetermined angle as aforesaid.

4,392,521

SIMPLIFIED ADJUSTABLE TIRE CHAIN

Victor S. Giannone, 7 Fox Hill Rd., Peekskill, N.Y. 10566

Continuation-in-part of Ser. No. 315,960, Oct. 28, 1981. This application Aug. 23, 1982, Ser. No. 410,416
Int. Cl.³ B60C *27/00, 27/06, 27/10*
U.S. Cl. 152—218 **16 Claims**

1. An adjustable size tire chain structure comprising

a plurality of metal cross chains each having an end link at each end,

an inboard rope connector for interconnection with the inboard ends of said cross chains,

an outboard rope connector for interconnection with the outboard ends of said cross chains,

a combined rope to cross chain connecting link and rope clamping ring and rope connector adjustment device provided at each end of each cross chain for connection to said inboard and outboard rope connectors,

each of said connecting links comprising

a substantially V-shaped wire body with a loop formed at each end of the V,

said wire body being connected to the associated cross chain end by linking through the end link at the bottom of the V,

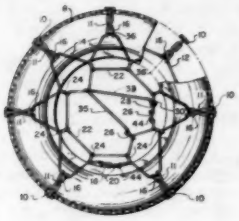
said loops each being engaged with the associated one of said rope connectors by at least partially surrounding the rope connector,

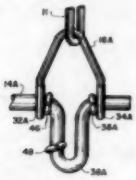
both of said loops being dimensioned and arranged to partially surround and slidably engage said rope,

each of said slidably engaged loops being open sufficiently to permit the rope to be slipped out of and into said loop,

a set of at least three collars clamped to said rope at spaced positions upon said rope in the vicinity of each of said connecting links with at least two of the three collars positioned between the loops of the associated connecting link,

each of said collars being sufficiently large to prevent the portion of the rope to which the collar is clamped from





sliding through either of said slidably engaged loops, one of the outer ones of said collars and the middle one of said collars being spaced apart to respectively fit between said loops and to fit in closely spaced relationship to the inner sides of said two loops to prevent longitudinal movement of said rope with respect to said link when the section of rope between said loops is straight, the other outer one of said collars being operable when positioned inside the adjacent loop of said link in conjunction with the positioning of the first outer collar inside the other loop to shorten the rope by forming a loop of rope between said loops of said link.

4,392,522

TIRE WITH OPEN CELL FOAM INSERT FOR REDUCING NOISE

Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 202,883

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946273

Int. Cl.³ B60C *18/00*

U.S. Cl. 152—341 **5 Claims**

1. A wheel tire not having a run-flat ability, comprising a tire body having an inner surface defining an inner tire volume, noise absorbing means in the form of an open cell foam material inside only a portion of said inner tire volume, means securing said noise absorbing open cell foam material to portions of said inner surface of said tire body, said noise absorbing material having a given size and a large surface area relative to its given size, said large surface area with the open cells being sufficient to substantially avoid noise level amplification or space resonance amplification in said tire volume, and wherein said securing means for said noise absorbing means comprise at least one, preferably a plurality of noise absorbing relatively flat connecting members, both surfaces of which are covered with said open cell foam material to hold said large surface area of open cells substantially out of contact with said inner tire surface, said flat members having at least one edge connected to said inner tire surface for securing the open cell foam material inside the tire while leaving both sides of said flat connecting member substantially exposed to the air inside the tire.

4,392,523

PROCESS AND APPARATUS FOR CONTROLLING THE LEVEL OF A MOLTEN METAL SURFACE IN CONTINUOUS CASTING MOULDS

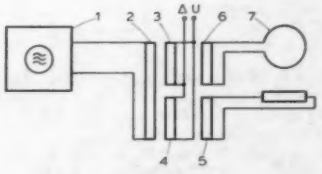
Manfred Beller, Illerrieden, and Hans Wiedenmann, Vöhringen, both of Fed. Rep. of Germany, assignors to Wieland-Werke A.G., Metallwerke, Ulm, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,883

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951097

Int. Cl.³ B22D *11/16*; G01N *27/72*

U.S. Cl. 164—453 **20 Claims**



1. A process for controlling the level of a molten metal level in a continuous casting mold comprising the steps: (a) providing a continuous casting mold, (b) providing a probe in the vicinity of the mold for sensing the metal level, said probe being associated with a compensating coil, said probe and compensating coil being in coupling relation with two secondary receiver coils, all said coils being spatially separated from the mold, said secondary receiver coils being arranged to provide a voltage difference therebetween, (c) generating a high frequency alternating magnetic field to induce voltages in said secondary receiver coils, (d) filling the mold with molten metal until reaching a required level in said mold, thereby creating a voltage difference in said secondary receiver coils, (e) balancing the voltage in said secondary receiver coils to reduce the voltage difference to zero, and (f) controlling the pouring of the metal into the mold to maintain the voltage difference at zero.

4,392,524

APPARATUS FOR REMOVING A TUBE CORE FROM AND INSERTING SAME INTO A HEAT EXCHANGER

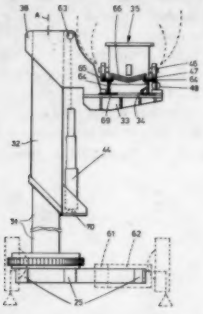
Ludwig Bauch, Kirchweg 7, 8079 Egweil, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,061

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046467

Int. Cl.³ F28F 9/00

U.S. Cl. 165—76 14 Claims



1. In combination with a heat exchanger having a horizontally elongated and longitudinally removable tube bundle, an apparatus comprising:

an elongated vehicular base provided with wheels and capable of rolling on the ground in a predetermined direction longitudinal of said base;

an upright vertically telescoping column supported on said base and defining an upright axis;

an elongated support to one side of the upper end of said column and defining a horizontal axis;

means for rotating said support about said upright axis, whereby said horizontal axis can be parallel or transverse to said elongated base;

a carriage displaceable axially along said support and adapted to engage the end of said bundle; and

means for displacing said carriage axially along said support when engaged with said bundle to displace said bundle along said support.

4,392,525

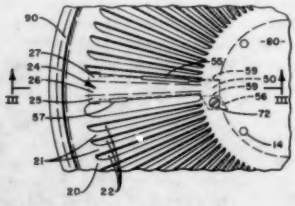
APPARATUS FOR SECURING A WIRE TO A GRILLE

Raymond D. O'Mara, Mallory; Michael E. Smorol, Syracuse, and Curtis L. Tobin, Chittenango, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 3, 1980, Ser. No. 202,983

Int. Cl.³ F28F 13/12, 9/24

U.S. Cl. 165—125 5 Claims



1. A heat exchange unit including a heat exchanger which comprises:

a fan orifice,

a fan powered by an electric motor for coacting with the fan orifice for circulating a heat transfer medium through the heat exchanger of the heat exchange unit,

a grille covering the fan orifice to allow heat transfer medium to flow therethrough while preventing foreign objects from being inserted therein, said grille including a portion extending from the fan motor to the fan orifice,

an electrical power source entering the heat exchange unit a distance from the electric motor,

at least one electricity carrying conductor connecting the electric motor to the power source, and

a wire guide extending between the fan orifice and the electric motor, said wire guide coacting with the portion of the grille extending from the fan motor to the fan orifice to define a cavity wherein the conductor connected to the electric motor is secured.

4,392,526

CONCENTRIC TUBE HEAT EXCHANGER WITH SPACER

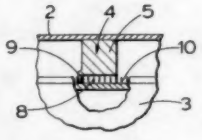
Manfred Hage, Ulm-Wiblingen; Hans Demuth, Vöhringen, and Otto Junker, Gerlenhofen, all of Fed. Rep. of Germany, assignors to Wieland Werke AG, Ulm, Fed. Rep. of Germany

Filed Apr. 24, 1981, Ser. No. 257,085

Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017574

Int. Cl.³ F28D 7/10

U.S. Cl. 165—154 10 Claims



1. A heat exchanger comprising an outer tube, at least one substantially concentric inner tube having an outer surface, a fin radially extending from the outer surface of the inner tube and having a height less than the distance between the inner and outer tubes, said fin being formed around the inner tube and extending therealong in turns, spacers being provided between each of the tubes, each spacer having a tubular sleeve which bears against the outer surface fin of the inner tube and at least three circumferentially, substantially equi-spaced, radial supporting elements supporting the outer tube inner wall, said tubular sleeve having at least one retaining member engaging in the groove between adjacent fin turns.

4,392,527

WATER WELL DEVELOPING SYSTEM

Ernest D. Hauk, and William C. Addison, both of Yucca Valley, Calif., assignors to Hawk Industries, Inc., Signal Hill, Calif.

Filed Mar. 3, 1981, Ser. No. 239,895

Int. Cl.³ E21B 43/112

U.S. Cl. 166—55.2 5 Claims

1. Well forming and clean-out apparatus comprising

a string of drill pipe adapted to be lowered into a well casing,

a fluid operated tool carried by said drill pipe string and adapted to be operated within the well casing by fluid transmitted through the drill pipe string, and

well clean-out means connected to and between said tool and drill pipe string and including

a clean-out body,

a plurality of clean-out ports in said body for transmitting pressurized fluid from said drill pipe string to the interior of a casing in which said well clean-out means is positioned,

passage means in said body for transmitting pressurized fluid

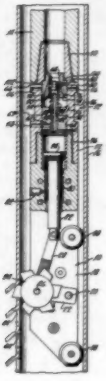
to said tool, said passage means including closure means for blocking said clean-out ports,

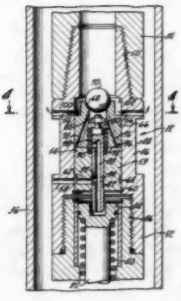
means for shifting said closure means to unblock said ports,

means responsive to said closure means for simultaneously releasing fluid from said tool,

said closure means comprising a valve spool assembly slidably mounted in said body, said passage means including a valve spool passage formed in said valve spool assembly, said means for shifting said closure means comprising means for blocking an end of said valve spool passage,

said valve spool assembly comprising a valve spool piston slidably mounted in said body between a first





position in which it blocks said clean-out ports and a second position in which the clean-out ports are unblocked, said valve spool passage having an upper end open to an upper end of said body, said means for blocking an end of said passage comprising a ball adapted to seat upon said open upper end of said valve spool passage,

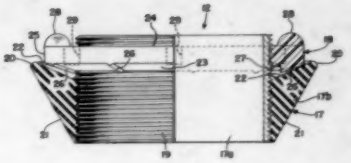
said means for releasing fluid from said tool comprising a body relief port in said clean-out body and a valve spool stem having a passage connected to said piston and communicating with said tool, said stem having a relief port positioned to communicate with said stem passage and said body relief port.

4,392,528

SWABBING CUP CONSTRUCTION FOR SWABBING AN OIL WELL PIPE

Robert C. Paulson, 2110 E. Shawnee Ave., Muskogee, Okla. 74401

Filed Dec. 7, 1981, Ser. No. 328,011
Int. Cl.³ E21B *37/10, 43/18*
U.S. Cl. 166—153 **9 Claims**



1. In an oil well swabbing tool for raising a mixture of liquids and particulate matter such as sand from an oil well pipe in which said tool comprises a cylindrical mandrel, a swabbing cup construction for mounting on said mandrel, said cup construction comprising first and second elements adjustably secured together, said first element comprising a rigid cylindrical member having an internal diameter substantially equal to the outer diameter of said mandrel for slidably mounting said cylindrical member on said mandrel, said first element further comprising an elastomeric material annular member molded circumferentially about one end portion of said cylindrical member, at least the other end portion of said cylindrical member being externally threaded, said annular member having leading and trailing surfaces extending radially outwardly and axially toward said other end portion of said cylindrical member, said trailing surface of said annular member further having the shape of the surface of a frustrum, the maximum diameter of said annular member being substantially equal to the inner diameter of said oil well pipe, said second element comprising a substantially rigid ring member internally threaded with threads complimentary to the threads on said other end portion of said cylindrical member, said ring member having radially extending leading and trailing surfaces, said leading surface of said ring member further extending in an axial direction toward said trailing surface thereof and being generally shaped as the surface of a frustrum, the maximum diameter of said ring member being substantially less than the maximum diameter of said annular member, said ring member being threaded on said other end portion of said cylindrical member with said leading surface of said ring member directed toward surface engagement with said trailing surface of said annular member, and the surface of a frustrum shape of said leading surface of said ring member relative to the surface of a frustrum shape of said trailing surface of said annular member providing increasing radial expansion of said annular member upon progressively greater threading movement of said ring member on said cylindrical member toward and against said annular member.

4,392,529

METHOD OF CLEANING A WELL AND APPARATUS THEREOF

Maurel R. Burwell, 4877 Arbor St., SW., Canton, Ohio 44710

Filed Nov. 3, 1981, Ser. No. 317,750
Int. Cl.³ E21B *37/00*
U.S. Cl. 166—255 **18 Claims**

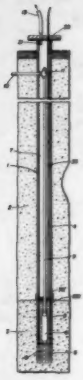
1. An improved method of cleaning a well including the steps of:

(a) sealing the well casing to form a generally air-tight enclosure therein;

(b) forming a vacuum within the well casing enclosure by pumping the air therefrom to raise a column of water within the well casing enclosure to a predetermined height;

(c) destroying the vacuum formed in the well casing enclo-

sure causing the raised water column to drop downwardly forcing the water out through inlet openings adjacent the bottom of the well casing and into the surrounding strata to remove encrustations and obstructions blocking the inlet openings; and



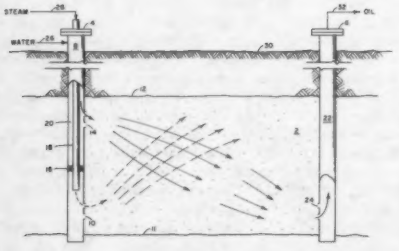
(d) repeating the raising and lowering of the column of water in the well casing enclosure by creating a vacuum therein and destroying the same to clean the well casing openings and surrounding strata.

4,392,530

METHOD OF IMPROVED OIL RECOVERY BY SIMULTANEOUS INJECTION OF STEAM AND WATER

Aziz S. Odeh, Dallas, and Billy J. Dotson, Grand Prairie, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,329
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—269 **1 Claim**



1. A method for recovering heavy oil from a subterranean permeable, heavy oil-containing formation penetrated by at least one injection well and at least one spaced apart production well, said injection well containing at least two separate flow paths, the first path in fluid communication with the upper portion of the formation and the second path in fluid communication with the lower portion of the formation, and said production well in fluid communication with the lower portion of the formation, comprising:

a. injecting steam into the lower portion of the formation via the second flow path of the injection well, said steam passing through the formation, displacing oil and reducing the oil's viscosity;

b. injecting unheated water into the upper portion of the formation via the first flow path of the injection well subsequent to the period of steam injection into the lower portion of the formation and prior to steam breakthrough to impede the upward flow of steam and divert it to previously unswept paths resulting in a higher vertical sweep efficiency to scavenge heat from the steam and become a hot water drive displacing oil reduced in viscosity from lower regions in the formation; and

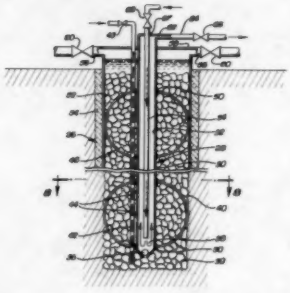
c. recovering oil from the lower portion of the formation via said production well.

4,392,531

EARTH STORAGE STRUCTURAL ENERGY SYSTEM AND PROCESS FOR CONSTRUCTING A THERMAL STORAGE WELL

Joe J. Ippolito, 13110 Lamplight Village Ave., Austin, Tex. 78758

Filed Oct. 9, 1981, Ser. No. 309,910
Int. Cl.³ E21B *33/138, 41/00*; F28D *15/00*; F28F *21/00*
U.S. Cl. 166—278 **40 Claims**



1. An earth coupled structural energy system comprising:

an energy distribution system for selectively applying thermal energy within a building structure;

earth storage means for communicating thermal energy with the earth, the earth storage means having a substantially moisture impervious integrated earth interface, thereby maintaining substantial thermal conductive moisture within the earth storage means, yet providing conduction to the earth at the integrated earth interface, the integrated earth interface generally defining an earth interface surface area;

fluid transport means disposed within the earth storage means for circulating a thermal transfer fluid through the earth storage means;

the fluid transport means having an interface with the earth storage means, the fluid transport means interface defining a surface surrounded in spaced-apart relationship to the earth interface surface area;

means for maintaining a high thermal conductivity at the fluid transport means interface; and

means for thermally communicating with the thermal transfer fluid to effect thermal changes in the energy distribution system;

the earth storage means having a high thermal permeability, whereby thermal energy is readily conducted between the earth and the fluid transport means with minimal thermal radiation.

35. The process for constructing a thermal storage well comprising the steps of:

drilling a well;

circulating mud through the hole to establish a filter cake;

running a thermal transfer conduit in the hole;

running a drill string within the hole while circulating mud;

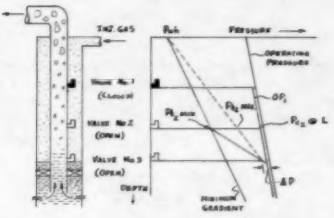
measuring moisture loss from the well; and

reverse circulating a sand/gravel slurry through the thermal transfer conduit to establish an intermediate particulate mass extending adjacent to the filter cake.

4,392,532
MINIMUM TEMPERATURE CORRECTION METHOD FOR LOCATING AND SETTING GAS-LIFT VALVES

Ivan J. Raggio, 2412 Yorktown, #297, Houston, Tex. 77056

Continuation of Ser. No. 17,441, Mar. 5, 1979, abandoned. This application Mar. 16, 1981, Ser. No. 244,085
Int. Cl.³ E21B *43/00, 43/12*
U.S. Cl. 166—372 5 Claims

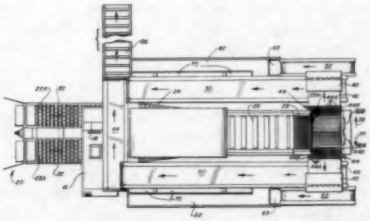


1. A method of spacing and pressure setting gas-lift valves of a gas-lift production system according to the production characteristics of liquid producing wells, said method comprising:
establishing the spacing of the various gas-lift valves relative to the surface;
establishing the reopening pressure settings of said gas-lift valves; and
correcting the spacing and reopening pressures of said gas-lift valves to accommodate the lowest temperature that could be encountered at any one of the valves while lifting from a lower valve.

4,392,533
ROOT CROP HARVESTER

Carl E. Bittle, Turlock, Calif., assignor to Universal Foods Corporation, Milwaukee, Wis.

Filed Jun. 5, 1981, Ser. No. 270,810
Int. Cl.³ A01D *17/00, 33/08, 91/02*
U.S. Cl. 171—14 11 Claims

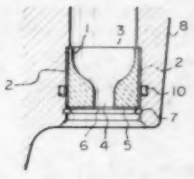


1. An apparatus for mechanically harvesting from a field a tuberous root crop subsequent to the latter having been uprooted, said apparatus comprising a frame movable in a forward direction across the field and having a front end provided with means for simultaneously collecting a mixture of roots, dirt clods and other debris as the frame moves in a forward direction; a first conveyor means mounted on said frame for receiving in a random arrangement the collected mixture and moving same rearwardly and upwardly from the frame front end and simultaneously therewith causing portions of the conveyed mixture other than roots to be initially separated from the remainder of the mixture and returned to the field; a second conveyor means mounted on said frame and adjacent the rear end of said first conveyor means for receiving in a random arrangement the remaining mixture discharged from the first conveyor means, said second conveyor means moving the discharged remaining mixture away from the rear end of the first conveyor means and simultaneously therewith causing additional portions of the conveyed remaining mixture other than roots to be separated therefrom and returned to the field; a third conveyor means mounted on said frame and having a receiving station spaced beneath the discharge end of said second conveyor means; a fourth conveyor means mounted on said frame and having a receiving station spaced beneath the discharge end of said second conveyor means, said third and fourth conveyor means being in substantially parallel relation and conveying in substantially the same direction; light emitting means mounted on said frame adjacent the discharge end of said second conveyor means for directing a plurality of light beams on the remaining mixture as it is being discharged from the second conveyor means; sensor means mounted on said frame adjacent the discharge end of said second conveyor means for sensing the light reflected from the discharged remaining mixture and generating signals therefrom, said generated signals being compared to a defined threshold signal level representing a root; signal responsive deflector means mounted on said frame and disposed between the discharge end of said second conveyor means and the receiving stations of said third and fourth conveyor means, said deflector means in response to predetermined signals from said sensor means passively causing detected roots to be directed in a random arrangement onto the third conveyor means receiving station while the remainder of the mixture is caused to be directed in a random arrangement onto the fourth conveyor means receiving station; a manual sorting station mounted on said frame adjacent said third and fourth conveyor means whereby undetected roots on said fourth conveyor means are manually transferred to said third conveyor means; and a root collection station mounted on said frame adjacent the discharge end of said third conveyor means.

4,392,534
COMPOSITE NOZZLE FOR EARTH BORING AND BORE ENLARGING BITS

Eishiro Miida, Ichikawa, Japan, assignor to Tsukamoto Seiki Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1981, Ser. No. 292,183
Claims priority, application Japan, Aug. 23, 1980, 55/119692[U]; Dec. 25, 1980, 55/182902
Int. Cl.³ E21B *10/18*
U.S. Cl. 175—340 1 Claim



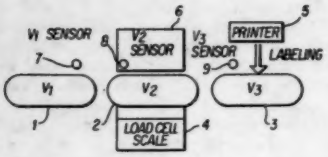
1. A complex nozzle for a drill bit and bore enlarging bit of the type having a plurality of rotary cutters provided at the lower end of the bit body, which composite nozzle comprises:
a ceramic member in the shape of a water discharge nozzle provided above the rotary cutters; said ceramic member having a mouth, a circumferential wall surrounding said mouth and a bottom surface, said mouth opening through said bottom surface;
a reinforcing metal ring fitted around the circumferential wall of said ceramic member to prevent damage thereto; and
a reinforcing metal plate having a central aperture overlying said mouth, bonded to said bottom surface so as to completely overlay said bottom surface to provide said ceramic member with impact resistance.

4,392,535

ZERO-POINT ADJUSTING METHOD FOR AUTOMATIC WEIGHING APPARATUS

Kunihiko Fujii; Yukihiro Hirosaki, both of Mishima; Yoshihisa Nishiyama, Shimizu Suntoh, and Koichiro Sato, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 117,786, Feb. 1, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,340
Claims priority, application Japan, Feb. 6, 1979, 54-13110
Int. Cl.³ G01G 11/04
U.S. Cl. 177—1 6 Claims



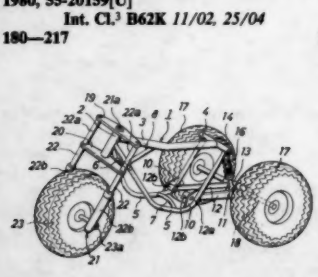
1. An automatic weighing method, comprising the steps of:
moving the object to be weighed on three consecutive conveyers;
sensing the presence or absence of the object on each of the three conveyers;
controlling the first conveyer in accordance with the presence of the object on the second conveyer to prevent the passage of additional objects onto the second conveyer when the object is present on the second conveyer;
weighing the second conveyer while said object is absent from the second conveyer and producing a first weight signal by means of a load cell;
weighing the second conveyer and said object while said object is present on the second conveyer and producing a second weight signal by means of a load cell;
storing a zero point weight on the basis of the first weight signal as an indication of the tare weight of the second conveyer;
setting the weight of the object into a register on the basis of the second weight signal and the zero point weight; and,
labeling said object with the weight label while present on the third conveyer.

4,392,536

VEHICLE

Kazuhiro Iwai, Iruma; Hiroshi Enomoto, Oimachi; Akito Enokimoto, Asaka, and Yoshitaka Kato, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1981, Ser. No. 232,434
Claims priority, application Japan, Feb. 14, 1980, 55-17130; Feb. 19, 1980, 55-20159[U]
Int. Cl.³ B62K 11/02, 25/04
U.S. Cl. 180—217 10 Claims



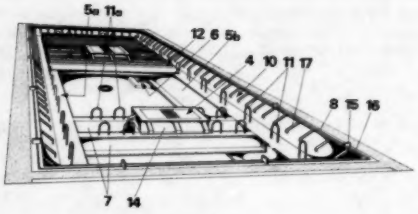
1. A vehicle with at least one front wheel and two rear wheels, comprising:
a frame structure;
a swing arm having two members extending rearwardly from said frame structure and a rear axle bearing member connected between rear ends of said two members, said rear axle bearing member supporting a rear axle for said rear wheels;
at least one rear cushion unit;
said rear cushion unit being interposed between said frame structure and said swing arm; and
said rear axle bearing member being disposed substantially centrally between said rear wheels and having the length dimension thereof extending substantially in the transverse direction of said vehicle.

4,392,537

WEIGHBRIDGE AND METHOD OF PRODUCING IT

Olle G. Lundborg, Malmö, Sweden, assignor to AB Bofors Elektronik, Bofors, Sweden

PCT No. PCT/SE80/00149, § 371 Date Jun. 15, 1981, § 102(e) Date Jun. 15, 1981, PCT Pub. No. WO81/01197, PCT Pub. Date Apr. 30, 1981
PCT Filed Oct. 15, 1980, Ser. No. 274,203
Int. Cl.³ G01G 19/02
U.S. Cl. 177—134 8 Claims



1. A weighbridge, comprising a cast concrete slab (1) and having supporting beams (5) resting upon transmitter members (6) wherein said supporting beams (5) being disposed as longitudinal beams of a metal frame consisting of said longitudinal beams interconnected by transverse beams, said metal frame supporting a preferably corrugated bottom metal sheet (12) of said concrete slab (1), that said concrete slab being in cast connection with said frame (5, 7) on the upper side of the metal bottom sheet and surrounded by a metal edge lining connected to the frame, and that the edge lining (3) is bounded at the top by a T-beam (8, 9), secured to the web (9) of which a metal sheet (10) is disposed at the tops of the beams.

4,392,538

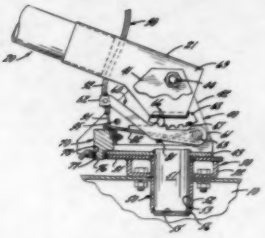
ADJUSTABLE HANDLE ASSEMBLY FOR WALK-BEHIND GARDEN IMPLEMENT

Gerold G. Goertzen, St. Anne, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Jan. 29, 1981, Ser. No. 229,521
Int. Cl.³ B62D 51/04
U.S. Cl. 180—19 R 12 Claims

1. In a walk-behind garden implement, the combination comprising a horizontally extending frame including a base member, ground engaging wheels for supporting the frame, a unitary handle extending upwardly and rearwardly from said base member and having a lower end and an upper guiding end for manual guidance of the implement, a yoke of hollow construction interposed between the lower end of the handle and the base member and connected to them by respective handle and base pivot connections, the handle pivot connection having a horizontal axis for angular elevation of the handle with respect to the frame and said base pivot connection having a vertical axis for azimuthal swing of the handle with respect to the frame, a first latching means defining an arcuately arranged set of spaced recesses at the lower end of the handle for holding the handle rigidly at a selected elevation, a second latching

means defining an arcuately arranged set of spaced recesses in the base member for holding the handle rigidly at a selected azimuth, the latching means including separate latching members arranged alongside one another within the yoke and movable into simultaneous register with respective sets of recesses, means interposed between the latching members for biasing the



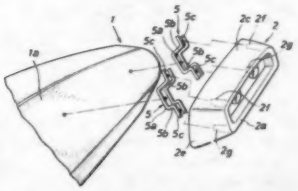
latching members in opposite directions into latching position, and means including a manually operated releasing member coupled to the said latch members for overcoming the force of bias and for temporarily disengaging the latching members thereby permitting the handle to be manually adjusted with respect to the frame to a more convenient elevation and azimuth.

4,392,539

INSTRUMENT PANEL WITH A YIELDABLE METER CASING

Takayuki Fujii, Saitama, and Hitoshi Suda, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 216,941
Claims priority, application Japan, Dec. 17, 1979, 54-174450[U]
Int. Cl.³ B60R *21/04*
U.S. Cl. 180—90 **8 Claims**



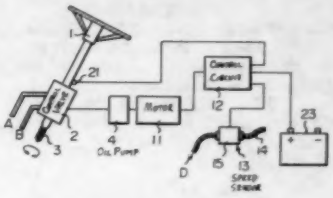
1. An instrument panel for vehicles, comprising:
an instrument panel base mounted on a vehicle body;
a substantially trough-shaped meter casing mounted on said instrument panel base;
at least one stay disposed in said trough-shaped meter casing;
said meter casing being provided with bosses extending inwardly within said trough-shaped meter casing toward said instrument panel base;
said stay including a pair of leg portions substantially angularly inclined relative to a principal direction of impacts against said meter casing;
said meter casing being fastened to said instrument panel base by said at least one stay at fastening portions of said meter casing defined by said bosses; and
said angularly inclined leg portions of said stay being adapted to buckle when said meter casing is subjected to impacting forces.

4,392,540

POWER STEERING DEVICE FOR A VEHICLE

Abe Michio, Kasugai, and Maeda Naoyuki, Inuyama, both of Japan, assignors to Tokai TRW & Co., Ltd., Japan

Filed Dec. 31, 1980, Ser. No. 221,612
Claims priority, application Japan, Jul. 16, 1980, 55-96967
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—142 **12 Claims**



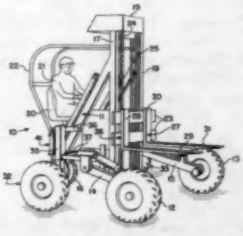
7. An apparatus for operating a power steering motor and turning a steerable vehicle wheel in response to rotation of a steering wheel, said apparatus comprising a pump, an electric motor connected with said pump for driving said pump to supply hydraulic fluid to the power steering motor, a vehicle speed sensor, a steering wheel rotation sensor, said steering wheel rotation sensor including means for sensing variations in a characteristic of the flow of fluid from said pump, and control means connected with said electric motor means, vehicle speed sensor and steering wheel rotation sensor for varying the angular velocity at which said electric motor means drives said pump, said control means including means for causing said electric motor means to drive said pump at an angular velocity which varies as an inverse function of vehicle speed in response to a variation in the sensed characteristic of the flow of fluid from said pump.

4,392,541

VEHICLE CONVERTIBLE FROM A TRICYCLE TWO WHEEL DRIVE TO A FOUR WHEEL FOUR WHEEL DRIVE

John Barchard, Crystal Lake, Ill., assignor to Spyder Sales & Service, Inc., Needville, Tex.

Filed May 1, 1981, Ser. No. 259,513
Int. Cl.³ B62D *61/012*
U.S. Cl. 180—209 **2 Claims**



1. A vehicle of the tricycle wheel type in which transversely spaced apart wheels are located in the front of the vehicle and are rotatably driven to effect propulsion and steering of the vehicle, a caster wheel located generally centrally of the vehicle at the rear thereof, auxiliary wheels mounted on the rear of said vehicle and one spaced transversely outwardly on each side of said caster wheel, means moving said auxiliary wheels generally vertically relative to said vehicle so that they may be either spaced above the caster wheel or below the caster wheel, and means rotatably driving said auxiliary wheels there-

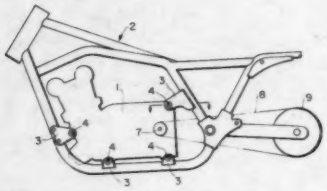
upon optionally having a two wheel drive tricycle vehicle or a four wheel drive vehicle, said means moving said auxiliary wheels generally vertically including a cylinder and piston means for extending and/or retracting said auxiliary wheels, and means for generally vertically guiding said wheels comprising a generally vertically fixed square tube and a square piston-like member telescoped within the bottom of said square tube.

4,392,542

DEVICE FOR PREVENTING DISPLACEMENT OF AN ENGINE IN A MOTORCYCLE

Yasuaki Aiba, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,554
Claims priority, application Japan, Jan. 9, 1981, 56/1488[U]
Int. Cl.³ B60K *11/04, 5/12*
U.S. Cl. 180—228 **8 Claims**



1. A device for preventing displacement of an engine in a motorcycle which includes an engine, a body frame, a driving chain transmitting an output of said engine to a rear wheel, and a plurality of brackets fixed to said body frame for mounting said engine thereon by a plurality of mounting bolts, said mounting bolts being supported by said brackets and extending along a transverse direction of said motorcycle, and said engine being formed with holes to allow extension of said mounting bolts, comprising;

(a) a pair of rigid tubular members fitted about each of said mounting bolts, a member of said pair positioned adjacent to each end of said bolts, said tubular members having one end provided with a flange which defines a pair of stops abuttable on an inner peripheral surface of said holes, and

(b) a generally cylindrical anti-vibratory rubber member encircling each of said tubular members and secured thereto.

4,392,543

HYDROSTATIC TRANSMISSION CONTROL

Norman O. Buckhouse, Kansasville, Wis.; Aaron A. Stevens, Spring Hill, and Randall K. Lawrence, Fairview, both of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.

Filed Feb. 26, 1981, Ser. No. 238,624
Int. Cl.³ B60K *20/00*
U.S. Cl. 180—272 **11 Claims**

1. A speed control assembly for a motor or engine comprising:

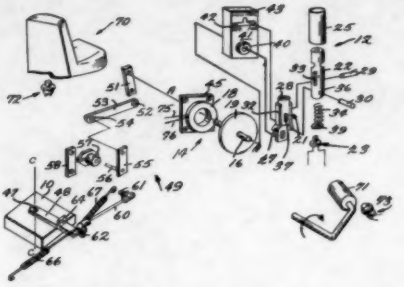
a speed control lever;

a shaft for mounting said speed control lever for movement about a given axis;

means operatively connected to said shaft for effecting speed control of a motor or engine in response to rotation of said shaft;

means for latching said speed control lever in an infinite number of positions to which it is moved by pivotal movement thereof about said axis, said latching means comprising an annular electromagnet disposed in a plane perpendicular to said shaft axis of rotation, and a disc mounted on said shaft for rotation therewith and disposed in a plane perpendicular to said shaft axis of rotation and adjacent said electromagnet, so that said electromagnet when energized exerts a latching force on said disc to hold it in place;

means for mounting said speed control lever for movement in a mode different from said pivotal movement thereof about said axis; and



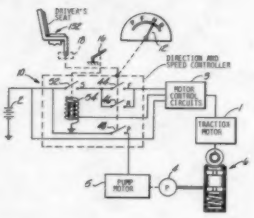
electrical switch means connected in series with said electromagnet and responsive to movement of said speed control lever in said different mode for effecting de-energization of said electromagnet, and therefore unlatching of said control lever for pivotal movement about said axis, when said control lever is moved in said different mode.

4,392,544

CONTROLLER FOR ELECTRIC TRACTION MOTOR

Guy L. Dilno, Plainwell, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 2, 1981, Ser. No. 239,284
Int. Cl.³ B60L *3/02*
U.S. Cl. 180—273 **8 Claims**



1. A controller for use in a vehicle having an electric traction motor with forward and reverse drive means,

a controller housing,

control means adapted to be actuated for selecting forward and reverse drive,

an actuator spool mounted in said housing and adapted for axial movement to neutral, forward and reverse positions,

cam means on said spool for selectively actuating said control means,

a manually actuable selector member movable to neutral, forward or reverse positions and being operatively coupled with said actuator spool for axial movement thereof to corresponding positions for selective actuation of the control means by said cam means,

detent means coacting between said spool and said housing for holding said spool in said forward or reverse position,

bias means continuously urging said spool toward said neutral position,

release means for releasing said detent means whereby said spool and said selector member are returned to said neutral position by said bias means,

and condition responsive means for actuating said release means.

4,392,545

ENGINE MOUNTING STRUCTURE FOR AN AUTOMOBILE BODY

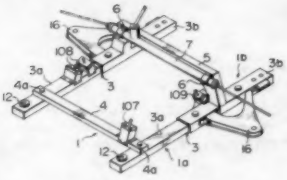
Hayathugu Harasaki, and Wataru Tsutagawa, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 9, 1981, Ser. No. 252,594

Claims priority, application Japan, Apr. 12, 1980, 55-49733[U]

Int. Cl.³ B62P *21/12*

U.S. Cl. 180—294 **9 Claims**



1. An automobile body including a front body section formed with an engine compartment, frame means provided in a lower portion of the engine compartment for mounting an engine, said frame means including a rear section secured to the body and extending forwardly into the engine compartment, and a front section having a front end portion removably attached through resilient means to the body and a rear end portion removably attached through second resilient means to the rear section, said engine being mounted on the front section of the frame means, suspension arms being swingably attached to the rear section, whereby said engine can be removed from the body together with the front section of the frame means.

4,392,546

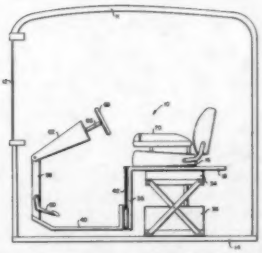
SUSPENDED OPERATOR STATION

Ross K. Brown, Cedar Falls; Raymond D. Thompson, Waterloo; Terrill W. Woods; Darrell L. Wright, both of Cedar Falls, all of Iowa; James M. Conner, Old Greenwich, Conn.; William E. Crookes, Waldwick, N.J., and William F. Purcell, New York, both of N.Y., assignors to Deere & Company, Moline, Ill.

Filed Dec. 24, 1980, Ser. No. 219,986

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—326 **22 Claims**



22. A suspended operator station comprising the combination of:

a cab having a windshield and a floor at fixed locations;

a height adjustable support mounted on the cab floor;

a platform mounted on the height adjustable support;

at least one control coupled to the platform;

a seat mounted on the platform;

means coupled between the seat and the platform for permitting adjustable fore-aft movement of the seat relative to the at least one control;

the height adjustable support positioning the platform and thereby the seat to dispose an operator at a desired location relative to the cab windshield and the means for permitting adjustable fore-aft movement of the seat positioning the seat at a desired location relative to the at least one control; and

an attenuator assembly disposed between the platform and the cab floor and operative to permit limited, attenuated movement of the platform and the included seat and at least one control relative to the height adjustable support substantially exclusively in a generally horizontal plane.

4,392,547

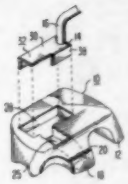
HEARING AID EARMOLDS

Lawrence K. Baker, Kane St., Box 818, Gate City, Va. 24251

Filed Jun. 11, 1981, Ser. No. 272,502

Int. Cl.³ H04R *25/00*

U.S. Cl. 181—135 **6 Claims**



1. A hearing aid earmold for amplifying selected sound frequencies including a resonant chamber characterized as comprising at least two interconnected chamber sections, a first (**25**) of which is adapted to extend into the ear canal of the user, and a second (**24**) of which is disposed generally transversely of the first section and along an axis discontinuous therewith, the cross-sectional area of the interface between said two sections being not significantly less than that of said second section along a portion thereof adjacent to said interface, the resonant frequency of said chamber being a function of the combined lengths of said two sections.

4,392,548

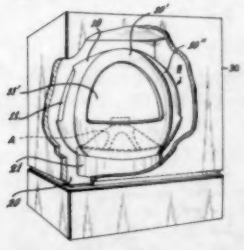
SPEAKER ENCLOSURE AND METHOD OF PRODUCING SAME

Gary C. Bailey, Burbank, Calif., assignor to Engineering Development Company, Burbank, Calif.

Filed Nov. 13, 1980, Ser. No. 206,471

Int. Cl.³ H04R *1/20*

U.S. Cl. 181—156 **9 Claims**



1. An improved speaker enclosure for re-radiating biphase sound radiating from a speaker supported and enclosed therein, comprising speaker mounting and enclosing means for combin-

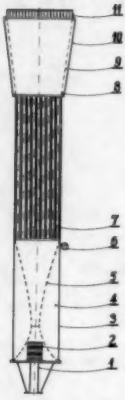
ing and re-radiating back and front of speaker sound in a predetermined radiation pattern, back of speaker sound re-radiating means comprised of compliant material, said sound re-radiating means comprising a plurality of substantially airtight panels, connectable to a speaker so as to extend about and enclose the speaker in substantially airtight relationship, each panel including a high audio frequency wavefront transmitting portion, and means for elastically sealing and securing the plurality of panels to each other.

4,392,549

BOILER NOISE SUPPRESSOR

Stanistaw Wrobel, and Ryszard Wegrzyn, both of Gliwice, Poland, assignors to Instytut Chemii Nieorganicznej, Gliwice, Poland

Filed Mar. 3, 1982, Ser. No. 354,446
Claims priority, application Poland, Mar. 10, 1981, 230087
Int. Cl.³ F01N 7/00
U.S. Cl. 181—239 **5 Claims**



1. A noise suppressor for exhaust steam from high-pressure industrial-power boilers comprising a cylinder with sound deadener packing and with a truss attached to the cover of an inlet flange by means of brackets spaced from the cover and with a clearance, a perforated expansion nozzle, a pipe system of several hundreds of pipes, a perforated outlet nozzle of an included angle of the cone, at least one truss with a clearance mounted on a collar of an inlet nozzle and preferably inside the nozzle and wherein the ratio of the diameter of an outer cylinder to the diameter of the inlet flange in the cover is from 3 to 5, the ratio of the length of a perforated outlet nozzle to the diameter or said outer cylinder is at least 1, with the ratio of the length of the perforated expansion nozzle to the diameter of the inlet flange being at least 12.

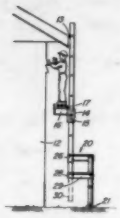
4,392,550

SCAFFOLDING ARRANGEMENT

Gaetan G. Bergeron, P.O. Box 1324, Assiniboia, Saskatchewan, Canada

Filed Apr. 24, 1981, Ser. No. 257,328
Int. Cl.³ E04G 1/18, 3/04
U.S. Cl. 182—82 **7 Claims**

1. A scaffold structure comprising:
(a) a pair of vertical posts;
(b) a pair of brackets, said brackets being slidably mounted on respective ones of said posts and each having a strut projecting therefrom to support a platform;
(c) means to lock the brackets on the respective posts at various selected vertical positions; and
(d) support secured to each post adjacent the lower end thereof such that the bottom end of the post is out of contact with the ground, each said support comprising a pair of legs offset from one another in a first plane wherein said plane is offset from the post and means rigidly con-



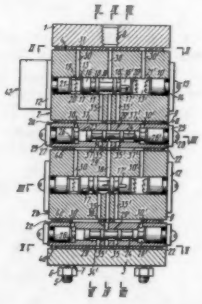
necting each of said legs to the post associated therewith, said connecting means comprising an upper and lower pair of rigid members connected at one end to an open ended box section in which the post is securely fastened and at the other end rigidly secured to said legs.

4,392,551

DOSING DEVICE FOR FEEDING LUBRICANT TO FRICTION COUPLES

Viktor P. Buryakov, ulitsa generala Karpenko, 6, kv. 24, Nikolaev; Gennady M. Ivanov, ulitsa 26 Bakinskikh komissarov, 8, korpus 4, kv. 40, Moscow; Mikhail I. Kislik, ulitsa Kosmonavtov, 82, kv. 8, Nikolaev; Pavel M. Kurgansky, ulitsa Kosmonavtov, 73, kv. 13, Nikolaev; Mark B. Shmotkin, ulitsa B. Morskaya, 17, kv. 2, Nikolaev, and Eduard V. Eikhenvald, ulitsa Pljuschikha, 42, kv. 122, Moscow, all of U.S.S.R.

Filed Jul. 24, 1981, Ser. No. 286,685
Int. Cl.³ F16N 25/02
U.S. Cl. 184—7 D **16 Claims**



1. A dosing device for feeding a lubricant to friction couples, comprising:
a valveless head section;
a plurality of distributing sections;
a valveless end section, said sections being successively interconnected in the direction of the lubricant flow;
a central supply duct provided in said valveless head section;
each said distributing section having its respective housing;
a through-going cylindrical chamber made in said housing of each said distributing section;
a distributing slide valve with reduced-diameter relieved areas, accommodated for reciprocation in said through cylindrical chamber made in said housing of each said distributing section;
two closures closing from the ends each said through cylindrical chamber, limiting the reciprocation of said respec-

tive distributing slide valve and defining therewith two respective metering-out end chambers, each one of said two metering-out end chambers communicating with one of the relieved areas of said distributing slide valve of the preceding upstream one of said distributing sections in the direction of the lubricant flow;

a central through-going duct made in said housing of each said distributing section, extending normally to the axis of said cylindrical through chamber and intersecting it;

outlet ducts made in said housing of each said distributing section;

the inlets of said outlet ducts connected to said through cylindrical chamber made in said housing of each respective one of said distributing sections;

the outlets of said outlet ducts adapted to supply the lubricant to the friction couples, opening onto the external lateral surface of said housing of each respective one of said distributing sections;

means for rotating one of said distributing slide valves about the axis thereof through a predetermined angle and for retaining it in the thus rotated position, mounted on one of said distributing slide valves and provided in at least one of said distributing sections;

other outlet ducts made in said housing of said at least one section accommodating said distributing slide valve provided with said means for rotating it through a predetermined angle and retaining it in the thus rotated position; the inlets of said other outlet ducts belonging to a single plane and being uniformly angularly spaced about the perimeter of the cross-section of the wall of said through cylindrical chamber, with the geometric axes of said inlets dividing the circumference of the cross-section of said cylindrical chamber into predetermined angles; the outlets of said other outlet ducts belonging to a single plane normal to the axis of said through cylindrical chamber and opening onto the lateral surfaces of said distributing section;

two distributing passages made each in the shoulder portion of at least one of said distributing slide valves provided with said means for rotating it through a predetermined angle and for retaining it in the thus rotated position, facing the respective one of said two metering-out end chambers, the inlet of each one of said distributing passages communicating with the relieved area of said respective slide valve, and the outlet of each one of said two distributing passages opening onto the external surface of the shoulder portion of said respective distributing slide valve; said outlet of one of said distributing passages communicating with one of said inlets of said outlets ducts in the extreme position of reciprocation of said respective slide valve, while said outlet of the other one of said distributing passages is accommodated intermediate said inlets of said outlet ducts in the same aforementioned position of said respective distributing slide valve; means for monitoring the axial and angular positions of said distributing slide valve, mounted on one of said distributing sections and operatively connected with said distributing slide valve.

4,392,552

DRAIN PAN FOR RADIATORS AND COOLING SYSTEMS

Joshua Partridge, 4020 Harlan St., Emeryville, Calif. 94608

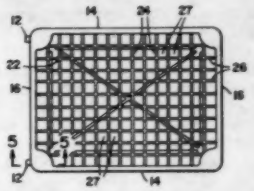
Continuation-in-part of Ser. No. 104,009, Dec. 17, 1979, Pat. No. 4,315,561. This application Mar. 3, 1981, Ser. No. 240,091

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ F16N *31/00*; B65D *1/24*

U.S. Cl. 184—106 **10 Claims**

1. A drain receptacle for receiving effluent from a vehicle, comprising a pan having a base panel, a plurality of sidewalls extending upwardly from the perimeter of said base panel and formed integrally therewith, said side walls extending continuously about said base panel and defining therewith an upwardly opening coffer, said base panel including shoulder portions extending upwardly into said coffer and disposed in longitudinal fashion along said side wall, lattice means disposed in said coffer for attenuating and arresting wave motion in and spattering from liquid contained in said coffer, said



lattice means impinging on and supported by said shoulder portions, wherein said base panel includes a plurality of corners, and a plurality of upwardly extending concave wall members, each disposed at one of said corners and extending between the sidewalls converging thereat.

4,392,553

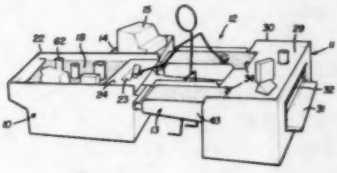
TWO HAND SCANNING CHECK-OUT COUNTER

Stephen W. Foster, North Java, N.Y., assignor to Almor Corporation, Ferndale, Mich.

Filed Jan. 30, 1981, Ser. No. 229,958

Int. Cl.³ A47F *9/04*

U.S. Cl. 186—61 **1 Claim**



1. A supermarket-type check-out counter comprising:

a relatively narrow, elongated, forward unloading module having an endless conveyor belt forming an upper, merchandise conveying surface for automatically moving goods from the forward end towards the rear end of the forward module;

a flat plate-like surface located rearwardly of the conveyor belt at the rear end of the forward module for forming a continuation of the module conveying surface;

an indicia scanning means located at the flat plate-like surface for sensing indicia imprinted upon goods which are slid over the flat surface, said scanning means arranged below said flat plate-like surface for scanning through a window-like area in said flat surface;

a relatively wide, rear bagging module, spaced a considerable distance rearwardly of the forward module, with the central longitudinal axes of the modules being in alignment, so that both opposite sides of the rear module extend transversely a greater distance than the corresponding sides of the forward module;

the upper surface of the rear module forming a merchandise receiving surface for use in placing goods located thereon into bags;

a pair of transversely spaced apart, elongated, side conveyor surfaces bridging the space between the forward and rear modules and with the opposite ends of said conveyor surfaces opening into their adjacent module ends, said side conveyors each being formed of an endless conveyor belt mounted upon a support frame means for providing con-

tinuously moving upper belt surfaces for automatically conveying goods to the bagging module merchandise receiving surface;

at least one of said side conveyor surfaces being hingedly connected to one module and releasably secured to the opposite module so that it may be manually movable out of normal position for providing ingress and egress for a check-out operator who is normally positioned in the space between the modules and side conveyor surfaces;

and the longitudinal axis of each of said side belts being transversely offset relative to the longitudinal axis of the unloading module belt, so that only a portion of the forward areas of each side belt transversely overlaps the adjacent side portion of the flat plate-like surface;

whereby goods unloaded by the customer upon the forward module conveyor belt are moved rearwardly to the operator who, using both hands, slides the goods across the flat surface for scanning the indicia, and then rearwardly and sidewardly upon either of the two side conveyor surfaces, along which surfaces the goods are moved to the rear module merchandise receiving surface for subsequent placement into bags.

4,392,554

LIFT MAST ASSEMBLY

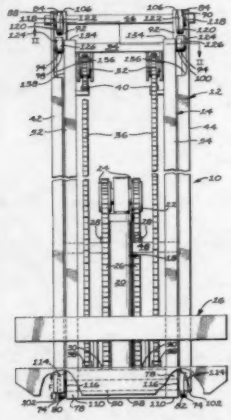
James W. Russey, Chardon, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US81/01422, § 371 Date Oct. 23, 1981, § 102(e) Date Oct. 23, 1981, PCT Pub. No. WO83/01434, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 23, 1981, Ser. No. 322,301

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **21 Claims**



1. In a lift mast assembly **(10)** having a fixed upright **(42)** and a movable upright **(52)** mounted on said fixed upright **(42)** and elevationally movable relative thereto, said fixed upright **(42)** having first **(60)** and second **(62)** spaced apart elongate flanges and an upper **(92)** end portion, said movable upright **(52)** having first **(66)** and second **(68)** spaced apart elongate flanges and a lower **(78)** end portion, said movable upright **(52)** having a lower guide bearing **(80)** mounted on the lower end portion **(78)** thereof and contactably engaged with one of the first and second spaced apart flanges **(60,62)** of said fixed upright **(42)**, and said fixed upright **(42)** having an upper guide bearing **(88)** mounted on the upper end portion **(92)** thereof; the improvement comprising:

an intermediate guide bearing **(98)** mounted on said fixed upright **(42)** at the upper end portion **(92)** thereof at a preselected elevationally spaced distance ("D") from said upper guide bearing **(88)** and between said upper **(88)** and lower **(80)** guide bearings;

said movable upright **(52)** being elevationally movable a first preselected distance, between a lowered position and an intermediate position, at which one of said first and second spaced apart elongate flanges **(66,68)** of the movable upright **(52)** is contactably engaged with the intermediate guide bearing **(98)** and said first and second spaced apart elongate flanges **(66,68)** of the movable upright **(52)** are free from contact with said upper guide bearing **(88)**; and

said movable upright **(52)** being elevationally movable a second preselected distance, between said intermediate position and a fully raised position, at which one of said first and second spaced apart elongate flanges **(66,68)** of said movable upright **(52)** is contactably engaged with the upper guide bearing **(88)** and both of the first and second spaced apart elongate flanges **(66,68)** of the movable upright **(52)** are free from contact with the intermediate guide bearing **(98)**.

4,392,555

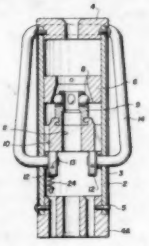
FALL PROTECTION DEVICE

J. Nigel Ellis, 306 Country Club Dr., Wilmington, Del. 19803

Filed May 4, 1981, Ser. No. 260,205

Int. Cl.³ B65H *59/14*

U.S. Cl. 188—65.1 **2 Claims**



1. In a fall protection safety device comprising:

(1) an elongated tubular housing having an upper open end, a lower open end, and an elongate volume therebetween;

(2) an upper end guide block having a centrally located opening therein, said upper end guide block being secured to said upper open end of the housing;

(3) a lower end guide block having a centrally located opening therein, said lower end guide block being secured to said lower end of the housing, said upper and lower end guide block openings defining a central passageway through which a safety line may be threaded;

(4) a wedging ring having a centrally located conical bore, said wedging ring being secured within the elongate volume;

(5) an axially movable line-gripping means for gripping a safety line upon movement upwardly within the conical bore of the wedging ring, said axially movable line-gripping means being associated with an axially movable piston having a centrally located opening and an outer surface adjacent to and circumscribed by the inner surface of said elongate tubular housing; and,

(6) moving means for moving the axially movable piston and the associated line-gripping means upwardly within the conical bore of the wedging ring;

the improvement which comprises:

(7) a serrated outer piston surface on said axially movable piston; and,

(8) a plurality of openings spaced apart from and around the centrally located opening of said lower end guide.

4,392,556

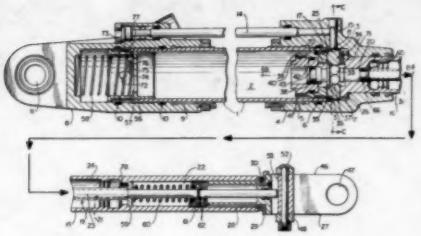
ACTUATOR LOCKING DEVICE

Edward J. Deutsch, Bellmore, N.Y., assignor to Arkwin Industries, Inc., Westbury, N.Y.

Division of Ser. No. 936,788, Aug. 25, 1978, Pat. No. 4,240,332. This application Aug. 5, 1980, Ser. No. 175,419

Int. Cl.³ F01B 25/26

U.S. Cl. 188—67 5 Claims



1. A device for locking a fluid pressure actuator in the extend position and unlocking it from such position by actuating detents, comprising cage means, a pair of rollers retained within said cage means, said rollers including elongated cylindrical members parallel and contiguous one another, said rollers retained by said cage means in alignment normal to the axial center line of the actuator, an unlocking rod extending from one end of said cage means along said actuator center line, a rod extension extending from the opposite end of said cage means along said actuator center line, sealing means on said unlocking rod and said rod extension, means on said unlocking rod retaining one end of an axially positioned spring, said spring normally urging said unlocking rod, cage means, rollers and rod extension in an extended direction along said actuator center line with said actuator in an extend position whereby said rollers urge said detents into a locked condition, and said rod extension having a diameter at its sealing means greater than that of said unlocking rod at its sealing means.

4,392,557

MECHANICAL ACTUATING DEVICE FOR A SPOT-TYPE DISC BRAKE

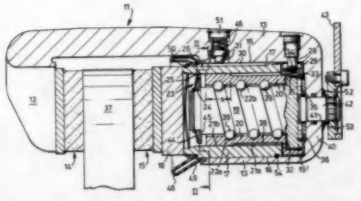
Helmut Franke, Wehrheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 23, 1980, Ser. No. 199,907

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946853

Int. Cl.³ F16D 65/52, 65/16

U.S. Cl. 188—71.9 48 Claims



1. A mechanical actuating device for a spot-type disc brake comprising:

a brake caliper embracing the outer periphery of a brake disc; said caliper including at least one axial cylindrical bore;

a hollow substantially cylindrical brake piston diposed in said axial bore acting on one brake shoe of said disc brake;

an actuating spindle disposed coaxially in said brake piston and adapted to be turned around its axis by an actuating means coupled thereto;

an actuating nut disposed coaxially in said brake piston between said brake piston and said actuating spindle and in a cooperating relationship with said actuating spindle, said actuating nut having on a portion of the outer surface thereof a first thread engaging a second thread associated with said brake piston, said actuating nut being secured to prevent rotation thereof by a rotation-preventing means; and

an automatic brake clearance adjusting device for said brake piston including said first and second threads and a clutch device coupled to said spindle to accomplish an axial adjustment of said brake piston when a predetetermined nominal brake clearance has been exceeded upon actuation of said disc brake.

4,392,558

ACTUATOR MECHANISMS FOR VEHICLE BRAKES

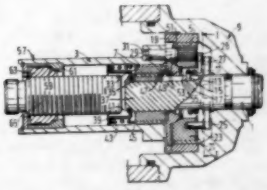
Helmut Heibel, Moschheim, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 6, 1981, Ser. No. 251,706

Claims priority, application United Kingdom, Apr. 22, 1980, 8013192

Int. Cl.³ F16D 65/30

U.S. Cl. 188—72.7 10 Claims



1. An actuator mechanism for a vehicle brake, comprising an axially rotatable actuator shaft and an actuator member which, in use, can be moved to actuate a brake, the actuator shaft and actuator member being interconnected by an assembly which comprises a first fast thread and a second fast thread, said first thread having a greater pitch angle than said second thread and having an operative connection with said actuator member to, in use, move the actuator member to take up any slack until friction surfaces of a brake interengage, said second thread having an operative connection with said actuator member to, in use, subsequently move the actuator member to apply the brake, a spring being coiled around the actuator shaft, one end of the spring being keyed to the shaft and the other end of the spring abutting a projection from an annular member, the annular member being mounted coaxially with the actuator shaft, a toothed disc mounted coaxially and non-rotatably on said actuator shaft being connected by a pin abutment to the annular member, the outer periphery of said annular member engaging with a fixed outer annular member by said first fast thread.

4,392,559

DISC BRAKE HAVING SLIDABLY MOUNTED CALIPER WITH FRICTION PAD SUPPORTING MEMBER PROVIDED THEREON

Harumi Oshima, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Feb. 10, 1981, Ser. No. 233,208

Claims priority, application Japan, Feb. 16, 1980, 55-19013[U]; Feb. 16, 1980, 55-19014

Int. Cl.³ F16D 55/224, 65/04

U.S. Cl. 188—73.32 5 Claims

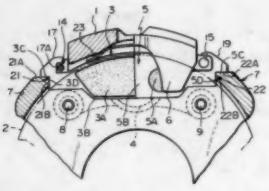
1. A disc brake mountable on a stationary member integral with a non-rotatable part of a vehicle and having spaced apart

arm portions, each arm portion having a horizontally extending guide and support surface and a vertically extending support and torque receiving surface, said disc brake being used for braking rotation of a rotatable disc and comprising:

a caliper having limb portions and being adapted to be slidably mounted on the stationary member which is integral with a non-rotatable part of a vehicle;

a pair of friction pads, each friction pad having downwardly facing guide surfaces positionable in contact with the horizontally extending guide and support surfaces of said arm portions of said stationary member and a torque transmitting surface for transmitting braking torque to the vertically extending support and torque receiving surfaces of said arm portions of said stationary member;

a brake actuator provided in one limb portion of the caliper for pressing one friction pad against one surface of the rotatable disc; and



a pad supporting member provided on the caliper for supporting said friction pads on the caliper when the caliper and friction pads are not mounted on the stationary member, and, when the disc brake is mounted on the stationary member, the relationship between the friction pads and said pad supporting member being such that:

the friction pads are slidably guided and supported on the horizontally-extending guide and support surfaces of the stationary member so that braking torque on the friction pads is directly transmitted to the vertically extending support and torque receiving surfaces of the stationary member; and

said pad supporting member is free from contact with the friction pads so that any braking force applied to the pads is transmitted only between the friction pads and stationary member.

4,392,560

DISC BRAKE WITH A CALIPER SUPPORTED BY SLIDE PINS

Kei Nakasu; Shigeru Ichikawa; Toshihiko Tanaka, all of Toyota, and Mitsuo Ikeda, Chiryu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 15, 1981, Ser. No. 273,321

Claims priority, application Japan, Jul. 2, 1980, 55-92954[U]

Int. Cl.³ F16D *65/09*

U.S. Cl. 188—73.34 **16 Claims**

1. A disc brake comprising:

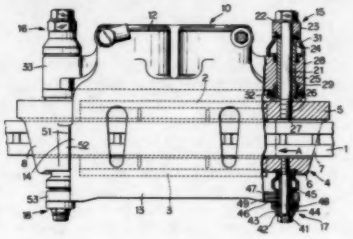
a disc rotor;

a pair of pad assemblies disposed on opposite first and second sides of said disc rotor;

a stationary torque receiving member including first and second plate portions disposed on said first and second sides of the disc rotor respectively and supporting said pair of pad assemblies slidably in a direction parallel to the axis of rotation of said disc rotor, said torque receiving member further including a pair of connecting portions connecting said plate portions across the outer periphery of said disc rotor;

a caliper including a fluid pressure cylinder portion facing one of said pad assemblies disposed on said first side of the disc rotor, a reaction portion facing the other of said pad assemblies disposed on said second side of the disc rotor, and a bridge portion connecting said cylinder portion and said reaction portion, said caliper straddling said pair of pad assemblies, said plate portions of the torque receiving member and said disc rotor for urging said pad assemblies onto opposite surfaces of said disc rotor on said first and second sides; and

first, second, third and fourth slide pins supporting said caliper slidably along said axis of rotation and partly fitted in first, second, third and fourth fit-bores respectively, said first and second slide pins extending from said first plate portion axially outwardly of said disc rotor and said third and fourth slide pins extending from said second plate portion axially outwardly of said disc rotor, said first and third slide pins being disposed co-axially with each other and constituting a first pair, said second and fourth slide



pins being disposed co-axially with each other and constituting a second pair, each one of at least said first pair of slide pins including a sleeve and a bolt, said bolt being fixed at one end thereof to the respective one of said first and second plate portions and having at the other end thereof an easily accessible head engageable with a wrench tool to remove said bolt to pivot said caliper about said second pair of slide pins for replacement of said pad assemblies, at least one of said first and second slide pins acting as a main slide pin which chiefly controls orientation of said caliper relative to said torque receiving member and the remaining slide pins each acting as an auxiliary slide pin which has less caliper orientation capability than said main pin.

4,392,561

DISC BRAKE

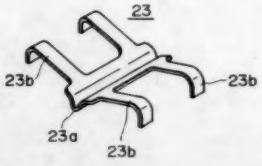
Mamoru Watanabe, Tokyo, Japan, assignor to Watanabe Engineering Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,235

Claims priority, application Japan, Jun. 28, 1979, 54-88653[U]

Int. Cl.³ F16D *65/00*

U.S. Cl. 188—73.36 **4 Claims**



1. A disc brake having a structure for supporting first and second friction pads mounted on backing plates, comprising a caliper body including a bridge section extending over a disc and first and second arm sections depending on either side of said pads, each arm section having a torque receiving portion with a horizontal shoulder, and a pad spring for resiliently holding the upper portions of the friction pads to come in pressure contact with the sliding plane of the disc, said friction pad backing plates comprising supports resting on said shoul-

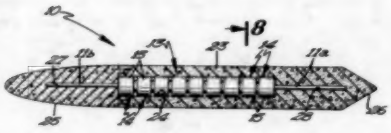
ders and means for contacting said spring, each said contacting means comprising at least one upwardly extending projection defining a non-centered side wall, said pad spring comprising a generally H-shaped, in plan view, unitary leaf spring having a longitudinal central body portion spanning said disc and said first and second pads, said central body portion being downwardly bent to form a depending longitudinal rib, and a pair of oppositely outwardly extending arms at each end of said central body portion, each arm terminating in a depending finger, said fingers being resiliently caused to engage fixedly with the inner side walls of said bridge section, and said rib being kept in contact with at least said side wall of said projection positioned on the side out of which the disc rotates, whereby said friction pads are held under pressure against the torque-receiving portions of a bracket, located out of which the disc rotates, and are forced in the direction of the rotating shaft of the disc.

4,392,562

LIMITED BEND MALLEABLE PENILE PROSTHESIS

John H. Burton, Minnetonka, and Michael A. Mikulich, St. Paul, both of Minn., assignors to American Medical Systems, Inc., St. Louis Park, Minn.

Filed Jun. 19, 1981, Ser. No. 275,288
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 **11 Claims**



1. A prosthesis adapted to be implanted in a penis, comprising:

at least one elongate, malleable element adapted to be selectively conformed to a desired shape,

an elongate, bend-limiting means positioned in cooperative juxtaposition with said malleable element, along at least a portion of its length said bend-limiting means having a plurality of adjacent elements which engage each other when a predetermined bending radius is reached as the prosthesis is bent, to limit the bending thereof; and,

an elongate, physiologically inert envelope covering said bend-limiting member and said malleable element.

4,392,563

BRAKE MECHANISM FOR MATERIAL HANDLING SYSTEM

Lee Holman, 505 Cuesta Dr., Aptos, Calif. 95003

Continuation of Ser. No. 136,178, Mar. 31, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,182
Int. Cl.³ B65G 11/00
U.S. Cl. 193—10 **1 Claim**

1. An unloading system for a cement carrying truck wherein cement is carried in a drum and emptied therefrom through a rear opening, said unloading system comprising:

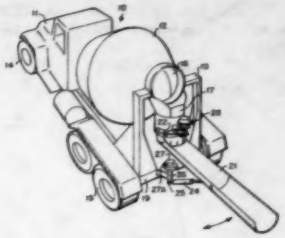
a dispensing funnel supported on said trunk and comprising a vertically extending cylindrical section positioned to receive and transport cement from said drum rear opening;

an elongated chute for carrying cement from said funnel;

means supporting one end of said chute in a position to receive cement from said funnel with the chute being rotatable in a generally horizontal plane about the cylindrical section of said funnel and to the rear of said truck; and

energizeable brake means for locking said chute in any of said positions about said funnel cylindrical section comprising:

a flange fixed to said chute and extending partially around and normal to said funnel cylindrical section to move around said funnel with said chute as it is rotated; and



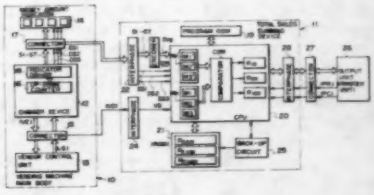
brake mechanism fixed to said funnel and including clamping means to squeeze said flange when said brake mechanism is energized thereby stopping and holding said chute in any selected horizontal position to which it is rotated.

4,392,564

TOTAL SALES SUMMING DEVICE FOR A VENDING MACHINE

Yukichi Hayashi, Sakado, Japan, assignor to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 233,462
Claims priority, application Japan, Feb. 14, 1980, 55-16965; Mar. 18, 1980, 55-33506[U]
Int. Cl.³ G07F 5/22
U.S. Cl. 194—1 N **11 Claims**



1. A total sales summing device for a vending machine, which vending machine includes counter means for cumulatively adding amounts of deposited coins and subtracting a vend price of a vended article and an amount of a paid out coin to obtain a balance of the amount of the deposited coins, characterized in that said summing device comprises:

first means for detecting increment and decrement in the balance of the deposited coins obtained by said counter means;

second means for conducting count-up or count-down in accordance with the increment or decrement in the balance of the deposited coins upon the detection by said first means; and

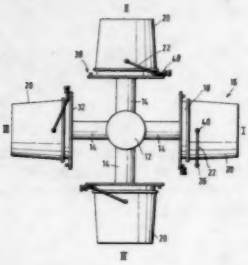
third means for substantially prohibiting counting by said second means of decrement of the balance if the decrement has been caused by subtraction for collecting a vend price;

a sales amount being obtained by said second means by counting up and down only increment and decrement in the balance caused by deposition and paying out of a coin.

4,392,565
HOLDING DEVICE FOR A HOLLOW BODY WITH AN OPEN END AND A PIVOTAL HANDLE FOR PRINTING THEREON IN A PRINTING MACHINE

Karl Strauch, Kirchlengern, Fed. Rep. of Germany, assignor to Werner Kammann Maschinenfabrik GmbH, Bunde, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,503
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033736
Int. Cl.³ B65G *17/32*
U.S. Cl. 198—378 22 Claims



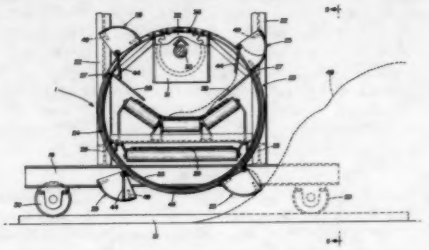
1. A holding device for a hollow body which is open at a first end and which is provided with a handle mounted pivotally thereon, to be printed upon in a rotary printing machine, the handle having an apex region which in the course of pivotal movement about its mounting on the hollow body experiences a change in its distance from the axis of the hollow body, the holding device comprising at least one shaft and a rotatable mounting member carried by the shaft, for holding a said hollow body, wherein at an end which is towards the shaft, the mounting member is provided with at least one locking member which is movable with respect to said hollow body carried by the mounting member and which is adapted to be brought into engagement with said apex region of the handle, thereby defining an operative locking position, and wherein the locking member is adapted to be moved from its locking position into another position in which it lies out of the arcuate path of movement described by the said apex region in the course of pivotal movement of the handle, and wherein a support member is arranged to rotate with the mounting member and carries the locking member and in the operative position of the locking member serves as an abutment for said apex region and aligns same relative to the locking member.

4,392,566
BULK MATERIAL HANDLING AND RECLAIMING EQUIPMENT

William H. Tschantz, Canton, Ohio, assignor to Quadracast, Inc., Canton, Ohio

Filed Jul. 29, 1981, Ser. No. 288,029
Int. Cl.³ B65G *17/36*
U.S. Cl. 198—509 10 Claims

1. Reclaimer construction for reclaiming bulk material from mounds thereof in storage areas of the type in which the mounds extend in rectilinearly or arcuately formed mounds of stacked bulk material; including frame means having spaced upright end support members; a cage extending longitudinally between and supported on said end support members; means for moving the frame means and cage in either direction laterally of the cage toward a mound of stacked bulk material; the cage including channel track means having members extending at spaced intervals endlessly around the cage and defining the periphery of the cage; said spaced track members being formed by channel ribs opening outwardly and extending semicircularly around at least the lower portion of the cage; curved wall members connected between adjacent pairs of channel ribs terminating in edges at each side of the cage extending longitudinally of the cage; baffle walls extending downwardly inwardly longitudinally of the cage from said upper curved wall edges; an endless belt conveyor extending longitudinally below the baffle walls from one cage end to a conveyor discharge end at the other end of the cage; a chain extending along each track member for movement in an endless orbit of

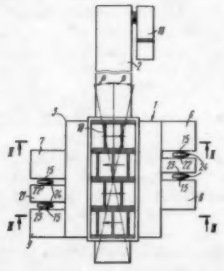


travel along said track means; means for moving said chains in either direction in said orbit of travel; a series of buckets pivotally mounted on said chains at spaced intervals extending between each adjacent pair of chains; the buckets in one series being mounted in staggered locations with respect to the buckets in the next adjacent series of buckets; and means for releasing material scooped by the buckets from each bucket as it moves upward along one side of the cage past an upper cage curved wall edge.

4,392,567
FEEDER OF BULK MATERIALS

Vladimir P. Glebov, ulitsa adm. Makarova 43, korpus 1, kv. 76; Georgy V. Krivtsov, Bakuninskaya ulitsa, 77, kv. 28; Jury V. Danchenkov, ulitsa Lesteva, 15, Korpus 2, kv. 57, all of Moscow; Sergei A. Khukhry, ulitsa Studencheskaya, 11, kv. 34, and Sergei G. Schepotin, ulitsa Gogolya, 17, kv. 37, both of Syzran, all of U.S.S.R.

Filed Nov. 12, 1980, Ser. No. 206,013
Int. Cl.³ B65G *47/04*
U.S. Cl. 198—544 13 Claims



1. A feeder of bulk materials comprising:
a conveyor; a batcher having a case separated into at least three sections positioned above the conveyor; a band encompassed within each said section serving to transfer bulk material; shafts positioned in said sections for driving said bands; drive means for driving a shaft of one of said bands in one of said sections in a first direction and for driving shafts of bands in others of said sections in a direction opposite said first direction, with said section using said band moving in said first direction being arranged between said sections using said bands moving in the

opposite direction of movement, said drive means including a common drive for all shafts of bands moving in the same direction of movement, said common drives having output shafts coupled with shafts of said sections through clutches serving for coupling and uncoupling of said drives and said shafts; receiver tube means adapted for receiving bulk material disposed in a top part of said case of said batcher and for supplying the received bulk material to said sections; and outlet tube means located in a bottom part of said case of said batcher above said conveyor so that bulk material is supplied from said batcher through said outlet tube means to said conveyor.

4,392,568

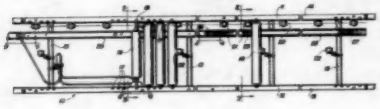
LIVE ROLLER CONVEYOR

Harold L. Turnbough, St. Louis, and Charles W. Werntz, Ferguson, both of Mo., assignors to Alvey Inc., St. Louis, Mo.

Continuation of Ser. No. 917,788, Jun. 22, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 102,270

Int. Cl.³ B65G *13/06*

U.S. Cl. 198—781 **5 Claims**



1. A roller conveyor comprising: a plurality of spaced apart and generally parallel article supporting rollers forming an article conveying path; drive means in said conveyor beneath said plurality of rollers and normally engaged therewith to drive said rollers collectively and thereby move articles along the conveying path; expansible chamber brake means in said conveyor spaced from a predetermined group of said rollers, said predetermined group of rollers occupying a length of the conveying path sufficient to support articles spanning a distance substantially equal in length to said expansible chamber brake means; a source of fluid pressure; article sensing means in said conveying path in position for sensing article movement along said conveying path down stream from the location of said expansible chamber brake means; and timing means operated by said article sensing means and connected to said source of fluid pressure and to said expansible chamber brake means, said timing means being operable following the passage of a predetermined time period in the determination by said sensing means of an interruption in the article movement therebeyond for applying fluid pressure to said expansible chamber brake means to raise said predetermined group of rollers away from said drive means and thereby interrupt the article conveying drive imparted to said predetermined group of rollers after said predetermined time period has passed for stopping article movement beyond said predetermined group of rollers, said fluid pressure applying means being inoperable to supply the fluid pressure to said expansible chamber brake means to raise said rollers away from engagement with said drive means upon article movement out of position in which the presence thereof is determined by said sensing means prior to the expiration of said predetermined time period.

4,392,569

SOFT CONTACT LENS ASEPTICIZING CASE

Leo E. Shoup, 125 N. Mt. Vernon St., Prescott, Ariz. 86301

Continuation of Ser. No. 30,188, Jun. 6, 1979, abandoned. This application Jan. 15, 1982, Ser. No. 339,598

Int. Cl.³ B65D *85/00*; **B08B** *3/10*; **B65D** *85/38*; **A45C** *11/04*; **A61F** *9/00*

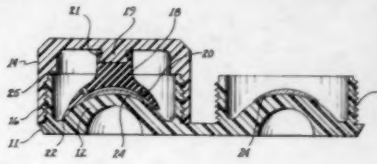
U.S. Cl. 206—5.1 **5 Claims**

1. A soft contact lens asepticizing case comprising:

(a) a base member having a surface containing two spaced central raised portions for receiving a contact lens thereon and an upstanding wall member surrounding each said central portion, said wall member having a height greater than the height of said central portion whereby the addition of fluid to said base member enables the central portion to be covered with fluid;

(b) sealing cap means for engaging each wall member and establishing a fluid-tight contact therewith;

(c) means contained on each sealing cap means for permitting the attachment of an internal guide thereto; and



(d) flexible internal guide means for attachment to each of said cap means, said guide means extending downwardly from said cap means to each central raised portion of said base member for maintaining a soft contact lens thereon, said guide means being spaced from said lens and containing at least one fluid passage therein to permit fluid to contact said lens.

4,392,570

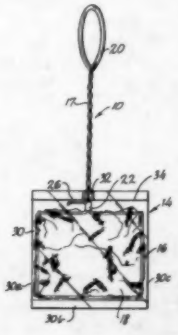
AQUARIUM NET ASSEMBLY AND PACKAGING THEREFORE

Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros. Inc., Englewood, N.J.

Filed Oct. 19, 1981, Ser. No. 312,221

Int. Cl.³ B65D *69/00*

U.S. Cl. 206—231 **1 Claim**



1. An aquarium net assembly comprising an aquarium net including a frame mounted netting sack and an elongated wand extending from said frame, a suspension bracket mounted on said wand for movement along the longitudinal axis of said wand for rotation about the axis said suspension bracket, comprising a sleeve frictionally engaged about said wand and an arm extending from said sleeve, said arm terminating in a downwardly extending lip in combination with a flat bag-like enclosure for said assembly within which said frame mounted net and said bracket is received, said bracket being disposed adjacent to the frame and having its arm in alignment with the plane of the frame thus constituting a flat packaged fish net assembly.

4,392,571

DEVICE FOR DISPLAYING AND MARKING FOODS OR THE LIKE

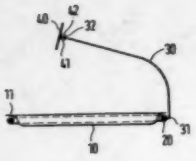
Trude-Helga Heidt-Cizerle, Bertholdstrasse 17, D7518 Bretten 1, Fed. Rep. of Germany

Continuation of Ser. No. 129,891, Mar. 13, 1980, abandoned. This application Nov. 10, 1981, Ser. No. 319,965

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910649

Int. Cl.³ B65D *1/34*

U.S. Cl. 206—557 **16 Claims**



1. Device for displaying and marking articles such as foods or the like comprising a flat rectangular tray (**10**) having a horizontally extending edge (**11**), and provided with a holder for receiving said tray, said holder having a carrying handle, characterized in that said holder (**20, 22**) is constructed in the shape of a flat rectangular frame which forms a receptacle for depositing said tray (**10**) with said edge resting on said rectangular frame; that said frame has the same cross-sectional shape on all sides; that a handle member (**30**) is attached to one side of said frame and projects toward the opposite side of said frame over said tray (**10**), the distance of said handle member above said frame and tray increasing toward said opposite side, and that to the free end portion of said handle (**30**) a marking plate (**40**) is connected or connectable to said handle, said marking plate (**40**) positioned in a manner such that it can be viewed from the side of the frame opposite the side of said frame that has said handle (**30**) attached thereto.

4,392,572

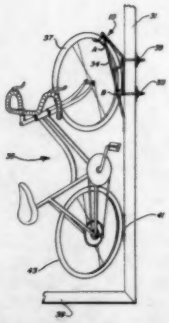
BICYCLE STORAGE RACK

Walter Bernard, 4800 South Lake Park Ave., Chicago, Ill. 60615

Filed Oct. 23, 1980, Ser. No. 200,256

Int. Cl.³ A47F *7/04*

U.S. Cl. 211—19 **8 Claims**



1. A storage rack for storing a small-wheeled bicycle on a vertical surface comprising;

means defining a channel for receiving a bicycle tire;

means integrally formed with said channel means for supporting a front wheel of a bicycle;

means for providing lateral stability to the front wheel of the bicycle, said providing means connected to said channel means and cooperating with said integrally formed means; and

means attachable to said channel means cooperating with said integrally formed means and engaging said providing means for supporting the front wheel of a small-wheeled bicycle;

said attachable means comprising a rod member having a straight portion abutting said channel means, a hook portion spaced inwardly toward said channel means, and an elevated portion extending out of a plane containing the straight portion and the hook portion, and including an inclined portion and a U-Shaped hook portion engaging said providing means whereby when the rack is mounted on a vertical surface the small-wheeled bicycle is totally suspended by its front wheel.

4,392,573

TIE ROPE COMPENSATION ARRANGEMENT

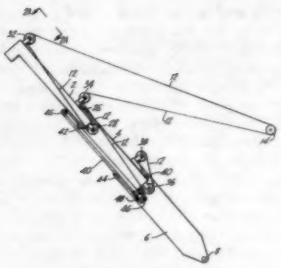
Karl M. Gyomrey, Belmont, England, assignor to Coles Cranes Limited

Filed Aug. 18, 1980, Ser. No. 179,307

Claims priority, application United Kingdom, Aug. 17, 1879, 7928798

Int. Cl.³ B66C *23/04*

U.S. Cl. 212—230 **7 Claims**



1. A telescopic strut jib crane comprising:

a crane base,

a turntable pivotally mounted to said base,

a jib mounted to said turntable so as to be able to elevate or lower about a pivot at the base of the jib,

said jib comprising at least three telescopic sections, each section telescoping one within the next adjacent telescopic station said sections comprising an outer section, at least one intermediate section and a base section, telescope means for extending telescopically jib sections from said base section,

support pulley means mounted to said turntable to the rear of said jib, tie rope means of fixed length,

said rope means passing from an anchorage at the head of said intermediate section to and around first extension pulley means at the base of said outer section to and around second extension pulley means at the head of said outer section to and around said support pulley means to and around third extension pulley means at the head of said intermediate section down said intermediate section and around fourth extension pulley means at the base of said intermediate section and to the head of the adjacent lower section,

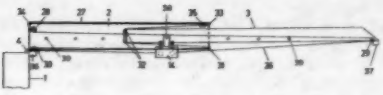
whereby each said section is supported by said rope means from said support pulley means.

4,392,574

TOWER CRANE

Karel H. A. Theyskens, Burgemeester Geyskensstraat 4, B - 3950 Beringen, Belgium

Filed Apr. 2, 1981, Ser. No. 250,125
Claims priority, application Belgium, Apr. 18, 1980, 58514
Int. Cl.³ B66C 23/64
U.S. Cl. 212—225 3 Claims



1. Tower crane comprising:
a pylon,
a telescopic jib which comprises at least two jib parts slidable relative to each other, namely a foot part fastened to said pylon and a slidable point part, which parts each have a runway extending along the lengthwise direction thereof,
a crab mounted on the jib and movable on each runway,
means to lock both said jib parts relative to one another,
a winch mounted adjacent to the foot part of the jib,
a cable pulley mounted on the end removed from the pylon of the jib point part,
at least one cable pulley mounted on the end lying on the pylon side of the jib point part,
two cable pulleys mounted on the end removed from the pylon of the jib foot part,
a cable pulley mounted on the end lying on the pylon side of the jib foot part,
a stop mounted on the foot part for stopping the movement of the travelling crab in the direction of the pylon,
a stop mounted on the point part for stopping the movement of the travelling crab in the direction of the jib end removed from the pylon, and,
a cable for sliding said jib in and out as well as for traversing said travelling crab over the jib,
said cable comprising two cable portions so connected to the winch that when one cable portion is wound up the other is unwound, both portions being connected to the travelling crab, one cable portion running from the crab over the cable pulley at that end removed from the pylon, of the jib point part to the winch, while the other cable portion runs from the crab over the cable pulley at that end lying on the pylon side, of the jib foot part, but thereafter runs back away from said pylon to one of the cable pulleys which are mounted on that end removed from the pylon, of said jib foot part, round said pulley back toward the pylon, over said cable pulley on that end facing the pylon of the jib point part, thereafter again away from the pylon, and finally over the second cable pulley which is mounted at that end removed from the pylon, of the jib foot part, back towards the pylon and to the winch.

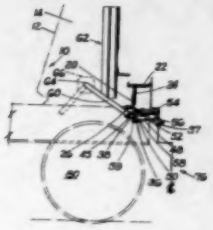
4,392,575

SWIVEL ASSEMBLY FOR END COCK

Thomas B. Baker, and Richard J. Mandrell, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed May 1, 1981, Ser. No. 259,626
Int. Cl.³ B61G 5/08; F16L 3/16
U.S. Cl. 213—76 5 Claims

1. A trainline connection assembly comprising: a support plate adapted to be rigidly attached to an end portion of the car; said plate including a slot; a swivel having a swivel flange portion engaging said plate and a swivel extension portion extending through said slot; said extension being freely rotatable about said swivel flange portion; said swivel having a hollow center portion; said swivel extension portion extending generally horizontally and having means including an extension elbow having an angle of less than 90° to receive a rigid pipe section extending inboard of the car; an end cock located outboard of said swivel and having an end cock flange portion abutting said swivel flange portion; means holding said swivel and said end cock in assembly and supported by said support



plate; said end cock including a handle extending outboard of said end cock; said end cock including glad hand connecting means including a glad hand elbow of less than 90° for receiving a flexible portion of the train line; said handle and said glad hand connecting means located within AAR clearance requirements for railway cars.

4,392,576

MULTILAYERED CONTAINER INCLUDING A LAYER OF MICROCRIMPED METALLIC FOIL

Richard F. Berger, Huntington; Greg Pardes, New York, and Bernard R. Gerber, Jamaica, all of N.Y., assignors to The Reseal Container Corporation of America, New York, N.Y.

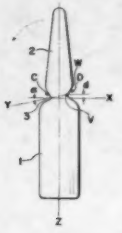
Filed Jun. 4, 1981, Ser. No. 270,244
Int. Cl.³ B65D 23/02
U.S. Cl. 215—1 C 10 Claims

1. A container blow molded from a multilayered wall preform comprising a wall structure forming a closed end, an oppositely disposed open end, and side walls extending between the closed end and the open end, said wall structure comprising a continuous multilayered wall forming said closed end and said side walls to at least adjacent the open end, said multilayered wall having an inner surface defining the inner surface of the container and an outer surface defining the outer surface of the container, said multilayered wall comprising at least one layer of an expanded plastics material and at least one layer of an expanded at least two-directionally microcrimped metallic foil with the metallic foil in surface contact with said plastics material layer wherein during blow molding of the preform said multilayered wall is expanded from the preform state into the desired container configuration.

4,392,577
GLASS VIAL WITH DIAGONAL CUT LINE

Hideyuki Maekawa, Osaka; Shinji Hiramoto, Kobe; Kozo Itaya, Sakai; Kokichi Sato, Habikino, and Hirotaka Nishida, Iwaraki, all of Japan, assignors to Shionogi & Co., Ltd. and Taisei Kako Co., Ltd., both of Osaka, Japan

Filed Apr. 10, 1981, Ser. No. 253,018
Int. Cl.³ A61J 1/00
U.S. Cl. 215—32 6 Claims

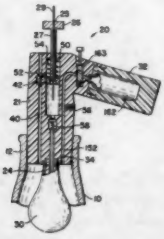


1. A glass vial having a main body, a branch pipe portion and an intermediate neck portion disposed therebetween, said neck portion containing indentation portions which are off-set relative to each other and a cut line provided at the intermediate neck portion for cutting the branch pipe portion of the vial from said main body thereof, said cut line being diagonally oriented with respect to a horizontal reference line which is normal to the central axis of the main body of the vial, said diagonal orientation of the cut line being positioned by connecting the innermost portions of said off-set indentations with said cut line.

4,392,578
STOPPER APPARATUS FOR CONTENT CONTAMINATION PREVENTION

Beverly A. Fipp; Bernard E. Fipp, both of 7728 Hidden Valley Ct., and John L. Haller, 7249 Carrizo Dr., all of La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 190,569, Sep. 25, 1980, abandoned, which is a continuation of Ser. No. 893,876, Apr. 6, 1978, abandoned. This application Oct. 22, 1981, Ser. No. 313,833
Int. Cl.³ B65D 39/12
U.S. Cl. 215—231 5 Claims



1. An improved stopper apparatus for content contamination prevention for a container having an opening, said container being partially filled with a gaseous contaminant and partially filled with a liquid substance which is to be protected from contamination by said contaminant, said stopper apparatus comprising:

(a) stopper plug;

(b) a means for securing such stopper plug to said container opening;

(c) a bladder removably fixed to the bottom of said stopper plug wherey said bladder is positioned within said container when said stopper plug is secured within said container opening;

(d) said stopper plug includes a means for inflating said bladder, a means for venting said gaseous contaminants when said stopper plug is secured in said container opening, said inflating means including a means for deflating said bladder, in combination with;

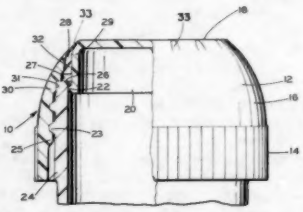
(e) a means for depositing a protective gas into said container when said stopper plug is secured in said container opening;

(f) said means for venting including a one-way check valve permitting the expulsion of the gaseous contaminant, said means for inflating said bladder including a tube member extending into said bladder connected to a one-way check valve permitting said bladder to be filled and preventing the filled bladder from exhausting its contents.

4,392,579
CLOSURE WITH DOMED PORTION

Albert R. Uhlig, Toledo, and Long F. Chang, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 21, 1981, Ser. No. 313,394
Int. Cl.³ B65D 51/16
U.S. Cl. 215—253 6 Claims



1. A thermoplastic closure for a container, said container having a threaded finish terminating in an annular rim, said rim defining an opening into said container and having an upper rim portion, a lower rim portion and a top rim portion, said closure comprising:

an annular internally threaded skirt portion operative to engage said container threads;

a unitary top portion extending upwardly from said annular skirt portion and closing the top of the closure;

a first and second sealing means depending from said top portion, said first sealing means including an annular sealing member depending downwardly from said top portion and operative to engage the upper rim portion on the inside surface of said finish and said second sealing means including an annular sealing member depending downwardly from said top portion and operative to engage the lower rim portion on the outside surface of said finish; and

at least one vent port disposed on said top portion radially between said first and second sealing means.

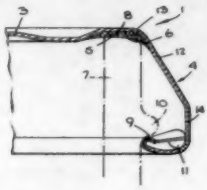
4,392,580
CLOSURE CAP

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Jul. 21, 1981, Ser. No. 285,610
Int. Cl.³ B65D 41/04
U.S. Cl. 215—332 14 Claims

1. In a closure cap having a metal shell with a cover and a depending skirt and having a flowed-in plastisol sealing gasket and inwardly projecting lugs formed on the bottom of the skirt for engaging lugs on a container the improvement comprising said cap skirt having a tapered upper portion extending downwardly and outwardly to the top of a generally cylindrical

lower skirt portion, said sealing gasket being positioned in a downwardly facing channel extending radially outwardly to the top of said tapered skirt portion and said tapered upper



portion having a radial dimension approximately equal to the radial width of the cap lugs and a vertical dimension greater than half the skirt height.

4,392,581
CONTAINER CLOSURE HAVING A LINER AND METHOD FOR ITS PRODUCTION

Junichi Itsubo, Hiratsuka; Fumio Mori, Yokohama, and Hideki Sato, Hiratsuka, all of Japan, assignors to Japan Crown Cork Co. Ltd., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 395,910
Claims priority, application Japan, Jul. 9, 1981, 56/106252
Int. Cl.³ B65D *53/00, 53/04*
U.S. Cl. 215—348 **8 Claims**

1. A container closure having a sealing liner comprising a vinyl chloride-type resin, said liner being composed of a composition comprising 100 parts by weight of the vinyl chloride-type resin and 35 to 200 parts by weight of a mixed fatty acid ester of glycerin derived from glycerin, at least one saturated or unsaturated fatty acid component having an even number of carbon atoms between 6 and 24 and at least one acetic and/or butyric acid component.

4,392,582
RETORTABLE BONDED CAN

Yoichi Kitamura, and Hisashi Hotta, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha Limited, Japan

Filed Apr. 7, 1981, Ser. No. 251,945
Claims priority, application Japan, May 26, 1980, 55-69012
Int. Cl.³ B65D *25/14, 25/34;* **B32B** *15/08, 27/38*
U.S. Cl. 220—75 **1 Claim**

1. A retortable bonded can made of an electrolytic chromic acid treated steel sheet wherein at least a part of the can body is composed of a steel sheet having on at least one surface thereof a metallic chromium layer, a chromium oxide layer and an organic lacquer film layer arranged in this order from the steel sheet surface and at least a part of the seaming portion of the can body is bonded with an organic adhesive, characterized in that

(1) the amounts of the metallic chromium layer and the chromium oxide layer deposited are 70–130 mg/m^2 and 5–30 mg/m^2, respectively, as metallic chromium; the amount of alkali-soluble chromium in these layers after heating at 210° C. for 10 minutes is not more than 12 mg/m^2 and not more than 70% by weight of the amount of the deposited chromium oxide before heating; the area of thickness unevenness of the chromium oxide is not more than 10%; and the amount of metal exposed, expressed as the amount of copper deposited, is not more than 30 mg/dm^2,

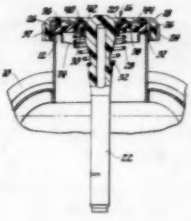
(2) the organic lacquer film layer is a baked and cured film of a mixed lacquer composed of 70 to 85 parts by weight of an epoxy resin having a number average molecular weight of 2900 to 3750 and derived from epichlorohydrin and bisphenol A and 30 to 15 parts by weight of a resol-type phenolic resin, the total amount of these resins being 100 parts by weight; the phenolic resin is obtained by reacting a mixed phenol composed of 5 to 20% by weight of a monohydric phenol and 95 to 80% by weight of bisphenol A with an aldehyde in the presence of ammonia and has such a molecular weight distribution that the proportion of a high-molecular-weight portion having 3 or more rings is 60 to 70% by weight and the proportion of a low-molecular-weight portion having 2 or less rings is 40 to 30% by weight; and the baked and cured film contains 83 to 87 parts by weight of the epoxy resin and 17 to 13 parts by weight of the phenolic resin based on 100 parts by weight of the epoxy resin and the phenolic resin combined, and

(3) the adhesive is a linear polyamide adhesive.

4,392,583
CAP AND VALVE ASSEMBLY

Tom C. Wong, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1981, Ser. No. 271,682
Int. Cl.³ B65D *51/16*
U.S. Cl. 220—202 **1 Claim**



1. A cap assembly for a liquid reservoir subjected to mechanical vibrations of randon frequencies and amplitudes; said cap assembly comprising a substantially cup-shaped cover member, latching means for securing the cover member to the reservoir, and a central stem portion integral with said cover extending into the reservoir when said cap assembly is placed on the reservoir; a flexible valve member adjacent the interior surface of the cover member and including an annular sealing portion contacting the reservoir and cover member, and a diaphragm portion disposed between the annular seal portion and said central stem and cooperating with the cover to form an air chamber means which expands and contracts in response to the mechanical vibrations of random frequencies and amplitudes; inlet air passage means in said cover member for communicating air from atmosphere to said air chamber means during expansion thereof; outlet air passage means between said stem portion and said valve member for communicating air from said air chamber means to the interior of said reservoir; said inlet passage means having greater resistance to air flow than said outlet passage during contraction of said air chamber means such that pulsating air flow into said reservoir minimizes liquid leakage therefrom; and spring means compressed between said latching means and said central stem for transmitting a force through said cover to aid the sealing at the annular sealing portion and to establish the at rest volume of the air chamber means.

4,392,584
VENT CAP FOR A CONTAINER ACCOMMODATING HYDRAULIC FLUIDS

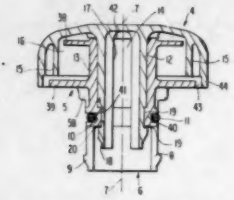
Ludwig Bauer, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 30, 1980, Ser. No. 202,413

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943747

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—374 **36 Claims**



1. A vent cap for closing and venting an opening of a container for hydraulic operating means located on the ambient-air side,

said opening comprising an aperture with edges for connecting the interior of the container with the ambient air,

having a lid-shaped part with a peripheral wall and a base-shaped part of the cap, where the base-shaped part of the cap is inserted within the peripheral wall of the lid-shaped part of the cap and has ring-shaped sealing means for the sealing of the opening disposed centrally with respect to a central axis, and

where one of the parts of the cap is provided with fastening means for the detachable securing of the fitting position of the vent cap at the opening of the container and both parts of the cap have corresponding central mounting supports for the mutual mounting,

with said mounting supports fastening the parts of the cap essentially immovably with respect to one another in the direction of the central axis,

characterized in that

the lid-shaped part of the cap has a journal located radially on the inside with respect to the central axis, and

the base-shaped part of the cap has a hub resting on the journal,

with the hub being provided with a central ring-shaped receiving groove contacting said edges which is separated from the fastening means, for said sealing ring means engaging said edges, and

both parts of the cap in fitting direction, by means of their journal-hub-mounting, being mounted so that they can be rotated freely with respect to one another.

4,392,585
STAR TRIP LABEL STRIPPER

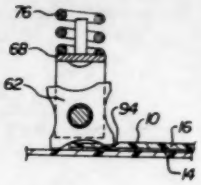
Charles F. Reed, Madison, and Charles M. Morrow, Painesville, both of Ohio, assignors to Avery International Corporation, Pasadena, Calif.

Filed Jul. 27, 1981, Ser. No. 287,111

Int. Cl.³ B65H *5/28*

U.S. Cl. 221—1 **10 Claims**

1. In a method of dispensing a succession of adhesive labels from a web of liner material to which the labels are temporarily adhered by feeding the liner with the labels thereon along a liner infeed path which leads along a first direction to a peel-back edge at a dispensing station, with the liner contacting the peel-back edge and the succession of labels each spaced from the peel-back edge by the thickness of the liner, and drawing the liner under tension over the peel-back edge and away therefrom along a liner outfeed path which leads from said peel-back edge in a second direction that is divergent from said first direction to thereby impose on the labels a tendency to continue to move in said first direction beyond said peel-back edge and thus to separate from said liner, the improvement which comprises striking a blow against the non-adhesive face of each successive label in the vicinity of the leading edge



thereof, such blow being sufficiently sharp to enhance such tendency to the point where there is accomplished the separation of labels which would otherwise resist such tendency and fail to separate.

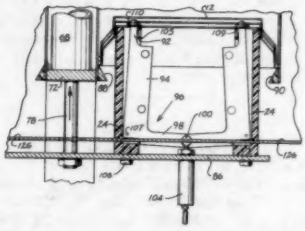
4,392,586
APPARATUS FOR SECURING CARTONS ON THE TOP OF ARTICLES CARRIED IN A CASE

Thomas S. Hartness, and Thomas P. Hartness, both of Greenville, S.C., assignors to Hartness International, Inc., Greenville, S.C.

Filed Nov. 10, 1980, Ser. No. 205,194

Int. Cl.³ B65G *59/06*; B65B *17/02*

U.S. Cl. 221—210 **7 Claims**



1. An apparatus for feeding cartons in succession from a stack of cartons, spaced openings provided in a main body portion of said carton for receiving articles, and a space provided between said main body portions of said cartons when carried in said stack, said apparatus comprising:

a support plate;

a plurality of picker fingers carried on said support plate;

outwardly extending projections carried adjacent a top portion of said picker fingers;

means for selectively moving said support plate to and from said stack of cartons for inserting said plurality of picker fingers adjacent said openings in at least the last carton of said stack of cartons allowing said outwardly extending projections to be inserted in the space between said last carton and the next to the last carton and for separating said last carton from the remainder of said stack of cartons;

a pivotal means supporting each of said outwardly extending projections; and

means for shifting said pivotal means moving said projections laterally of said fingers for inserting said projections between said last carton and said next to said last carton prior to removing said last carton from said stack,

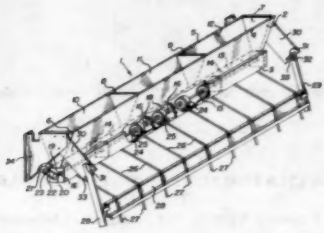
whereby said cartons are successively removed from said stack when said support plate is moved from said stack of cartons.

4,392,587

APPLICATOR FOR GRANULAR MATERIAL

W. John Bourne, P.O. Box 1333, Kindersley, Saskatchewan, Canada (S0L-1S0)

Continuation of Ser. No. 876,252, Feb. 9, 1978, abandoned. This application Oct. 2, 1980, Ser. No. 193,074
Claims priority, application Canada, Jan. 9, 1978, 294541
Int. Cl.³ G01F 13/00
U.S. Cl. 222—63 1 Claim



1. An applicator to be used on a vehicle for metering and discharging granular agricultural material, comprising:

a hopper for holding the granular material, said hopper having a base containing a plurality of orifices therein whereby the granular material may fall through each of said orifices by the action of gravity, said plurality of orifices being disposed in a line;

a rotatable shaft positioned below said orifices parallel to the line of said orifices in the vertical plane defined by said orifices;

a plurality of metering wheels mounted on said shaft for rotation with said shaft in planes perpendicular to the axis of rotation of said shaft, each said wheel being vertically aligned with one of said orifices with the center of said wheel coinciding with the axis of rotation of said shaft whereby the uppermost point on the periphery of each said wheel is vertically aligned with one of said orifices;

the uppermost point on the periphery of each said wheel forming a predetermined clearance with its orifice so that, given the dimensions and surface roughness of said wheels, the size of each said orifice, and the characteristics of the granular material, the granular material is discharged from between said hopper base and the periphery of each said wheel only when each said wheel is rotating and the rate of discharge depends only on the speed of rotation of said shaft and said wheels whereby the output of granular material is a linear function of the speed of rotation of said shaft and said wheels;

a downwardly disposed collector tube positioned below each said wheel for receiving the granular material discharged from between said hopper base and said wheel and for conducting the granular material to a spreader means, each said collector tube having a funnel forming the top end of said tube into which the granular material spills and a discharge end;

a motor for rotating said shaft and said wheels;

means for setting the speed of said motor and thereby the speed of rotation of said shaft and said wheels;

electric control means for automatically regulating said motor to maintain said shaft and said wheels at the set speed, said control means including means for constantly monitoring the speed of said motor and adjustment means for varying the electric input to said motor in accordance with the signals received from said monitoring means; and,

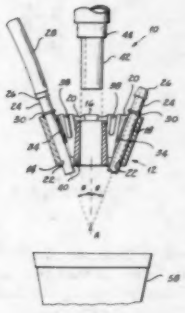
means for forward and rearward positioning of said discharge ends of said collector tubes, said collector tube positioning means comprising a horizontally disposed cross bar connected to said collector tubes adjacent said discharge ends and means cooperating with said cross bar for pivoting said cross bar and thereby said discharge ends of said collector tubes with respect to said hopper.

4,392,588

NOZZLE ASSEMBLY FOR COLD DRINK MERCHANDISER

Frank T. Scalera, Maplewood, N.J., assignor to Rowe International, Inc., Whippany, N.J.

Filed Jan. 22, 1981, Ser. No. 227,482
Int. Cl.³ G07F 13/06
U.S. Cl. 222—129.4 11 Claims

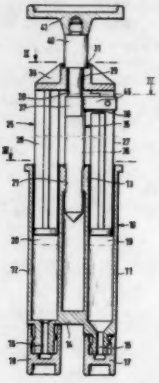


1. In a drink machine for selectively delivering one of a plurality of beverages each having a principal constituent and a selected flavoring constituent to a cup positioned at a delivery location at which the cup is accessible to a customer, apparatus including a unitary body formed with a base and a centrally located guide extending upwardly from said base, said guide formed with a bore having a longitudinal axis extending generally perpendicular to said base, said base having a plurality of holes therethrough outside said guide and circumferentially spaced around said axis, said body being formed with a wall extending upwardly from said base in the region of said holes to an upper rim, the inner surface of said wall inclined outwardly from said base toward said rim, a plurality of grooves in said inner surface extending from said rim respectively into said holes, a plurality of elongated syrup nozzles, each of said nozzles having a central passage with a longitudinal axis, an external surface with a generally circular cross-sectional shape and a positioning shoulder formed along the length thereof, each of said grooves having a generally semicircular cross-sectional shape whereby each of said grooves is adapted to receive one of said nozzles with the shoulder thereof in engagement with said rim to position said nozzle along the length of said groove, a plurality of retainers, means for releaseably securing said retainers to said body with the retainers in engagement with parts of said nozzles outside said grooves to retain said nozzles in said grooves, a beverage principal constituent supply fitting having a passage with a longitudinal axis and a shoulder and adapted to be received in said guide with the guide axis generally coincidental with the fitting axis and with said shoulder in engagement with the upper end of said guide, said body being formed with an ice chute support and means mounting said body in said machine at a position adjacent to said delivery location with said nozzle axes intersecting said fitting axis at a predetermined point above a cup at said delivery location.

4,392,589
MULTIPLE-TUBE DISPENSER

Wolf-Dietrich Herold, Hechendorf, Fed. Rep. of Germany, assignor to ESPE Fabrik Pharmazeutischer Preparate GmbH, Seefeld, Fed. Rep. of Germany

Filed Feb. 4, 1981, Ser. No. 231,447
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3005008
Int. Cl.³ B67D 5/42
U.S. Cl. 222—137 9 Claims



1. A multiple-tube dispenser comprising

(a) a body including at least two parallel cylinders, each having a discharge opening at a front end thereof, a piston slidably disposed in each cylinder, and a web portion of flexible material interconnecting said cylinders and having a first bore;

(b) pressing means including a head portion with a second bore, and a number of plungers equal to the number of said cylinders, said plungers being interconnected by said head portion, and each having a front end for engaging an associated one of said pistons; and

(c) a threaded spindle extending through said second bore and engaging said first bore for causing simultaneous movement of said pistons relative to said cylinders;

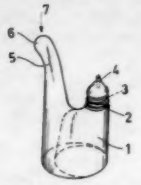
(d) said first and second bores having first and second slots, respectively, extending in a direction transverse to the axis of said spindle for permitting said spindle to be inserted into, and removed from, said first and second bores along said transverse direction, the width of said first slot being smaller than the outer diameter of said spindle.

4,392,590
EYE DROP DISPENSING BOTTLE

Ernest Hofmann-Igl, Kampen, Fed. Rep. of Germany, assignor to Basotherm GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,606
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946366
Int. Cl.³ A61M 1/00
U.S. Cl. 222—174 1 Claim

1. In an eye drop dispensing bottle made of elastically deformable plastic comprising a hollow body defining a cavity for containment of the product to be dispensed, a bottle neck extending upwardly from said hollow body and terminating in a dropping spout, said dropping spout and said bottle neck being in fluid communication with said hollow body, and a supporting finger extending upwardly from said hollow body and spaced from said bottle neck, the improvement which resides in that the supporting finger is made of soft-elastically yielding material, the upper end of said supporting finger is bent away from said bottle neck to form a soft, yielding supporting area, and the overall height of the supporting finger is

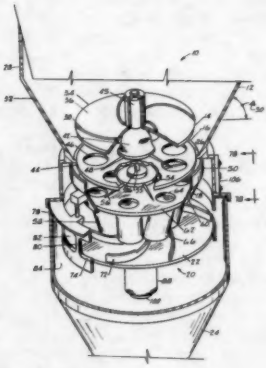


less than the overall height of the bottle neck and dropping spout.

4,392,591
APPARATUS FOR METERING SEMI-FLOWABLE MATERIAL

Arthur L. Fassauer, Canyon, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Nov. 13, 1980, Ser. No. 206,645
Int. Cl.³ B01F 7/24
U.S. Cl. 222—227 60 Claims



1. An apparatus for metering semi-flowable material, comprising:

a hopper for receiving a mass of semi-flowable material, said hopper having a bottom opening therein;

means for bottom unloading the semi-flowable material from the hopper and delivering said material in loosened condition and at a substantially reduced and controlled head pressure and density into an aeration and conditioning zone;

means for aerating and conditioning the loosened semi-flowable material to prevent the material from compacting and bridging and to place the semi-flowable material in a state of substantially constant density, said aerating and conditioning means including

a stationary pressure plate supported in the bottom opening of the hopper and having a plurality of holes therethrough,

an upper hub rotatably mounted above the stationary pressure plate and having at least one arm extending outward therefrom,

a lower hub rotatably mounted below the stationary pressure plate and having at least one arm extending outward therefrom, and

a plurality of substantially vertical probes extending downward from the bottom surface of the stationary pressure plate;

means for bottom unloading the semi-flowable material from the aeration and conditioning means and maintaining the material in a substantially constant density state for volumetric delivery into a distributing zone; and

means for distributing the semi-flowable material without inducing packing and bridging of the material for delivery by gravitational action into a collection hopper.

4,392,592

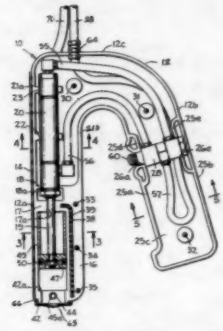
FOOD DISPENSING GUN

Norman D. Sullivan, 251 Donald Dr., Hollister, Calif. 95023

Filed Aug. 27, 1980, Ser. No. 181,773

Int. Cl.³ G01F *11/02*

U.S. Cl. 222—288 **7 Claims**



1. A dispensing device for dispensing condiment in partially liquid form comprising:

a housing including a handle section and an elongated dispensing section;

means in said housing defining a chamber having a discharge opening, said chamber being disposed in said dispensing section near one end thereof, and said discharge opening being located at said one end, said chamber defining means including an abutment member at the end of the chamber opposite said discharge opening;

a plunger mounted for reciprocation in said chamber;

spacer means disposed in said chamber between said abutment member and said plunger to limit the movement of said plunger toward said abutment member and thereby determine the condiment receiving volume of said chamber;

means for delivering a charge of condiment into that portion of the chamber located between said plunger and the discharge opening; and

means for actuating said plunger to discharge substantially all of the condiment contained within said chamber.

4,392,593

COFFEE POWDER METERING DEVICE FOR COFFEE VENDING MACHINES

Carlo D. Majer, Caronno Pertusella, Italy, assignor to Rhea Vendors S.r.l., Caronno Pertusella, Italy

Filed Mar. 17, 1981, Ser. No. 244,680

Claims priority, application Italy, Mar. 27, 1980, 20957 A/80

Int. Cl.³ B65D *88/54*

U.S. Cl. 222—305 **7 Claims**

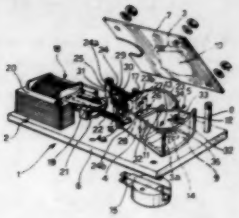
1. Coffee powder metering device for coffee vending machines comprising in a structure:

a tubular main part, formed by two opposite side panels and two walls, perpendicular to said side panels;

an end wall for closing off one end of the tubular main part, opened by power means;

a thrust wall inside said tubular main part, opposite the end wall and set at an adjustable distance from said end of the tubular main part, said thrust wall is moved by control means;

said tubular main part, end wall and thrust wall form a compartment for receiving a given quantity of coffee powder, through an inlet in one of the side panels, and



forcing it out through said end by means of the thrust wall, wherein on the two walls facing the compartment, the thrust wall is fitted with two lips facing the compartment, hinged to each other so as to form a V and each held firmly, by elastic means, against the respective walls of the two walls of the tubular main part so as to scrape it clean.

4,392,594

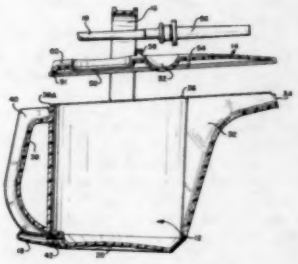
WATERING CAN

James B. Swett, Altamonte Springs, Fla., and Ann A. Arnold, Atlanta, Ga., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 27, 1980, Ser. No. 181,605

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—530 **4 Claims**



1. A receptacle for retaining and selectively dispensing liquid, said receptacle including a bottom and surrounding side wall terminating in an upper edge defining a fluid receiving interior with an open top, said side wall including one vertical segment having a projecting and laterally outwardly directed and upwardly opening discharge spout adjacent the upper open top of the fluid receiving interior, said side wall having a second vertical segment remote from said one segment and having a handle member projecting therefrom, said second segment incorporating a discharge opening from the receptacle interior below and in alignment with said handle member, said handle member extending vertically from said discharge opening to approximately the upper edge of the side wall, a flexible conduit in communication with and extending from said discharge opening, said handle member having a slot defined therein and extending along the vertical height of the handle member for removable engagement of the conduit in a recessed position therein from the discharge opening to the upper edge of the side wall, a cover member overlying and removably engagable with the upper edge of the side wall, said cover member including recess means therein for accommodating said flexible conduit, said cover member further includ-

ing holding means positioned thereon for selectively receiving a portion of said conduit and holding said conduit within said cover member recess means and said handle member slot.

4,392,595

APPARATUS FOR DISPENSING PARTICULATE MATERIAL

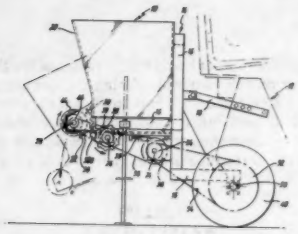
Eric Staniforth, Macclesfield, England, assignor to Sisis Equipment (Macclesfield) Limited, Macclesfield, England

Filed Oct. 3, 1980, Ser. No. 193,446

Claims priority, application United Kingdom, Oct. 3, 1980, 7934272

Int. Cl.³ B65G *27/12*

U.S. Cl. 222—619 **7 Claims**



1. Apparatus for spreading particulate material comprising a frame; a hopper supported by the frame, the hopper having a wall in which is provided a lower gravity feed outlet aperture; an adjustable gate forming part of said hopper wall for controlling the size of said feed outlet aperture; a feed platform forming a base of said hopper and extending away from the feed outlet aperture to define a material discharge edge that receives material from said hopper through said outlet aperture; means for reciprocating the feed platform with respect to said aperture while maintaining constant the distance between said feed platform and said adjustable gate, said means for reciprocating including means for moving the material discharge edge of said feed platform relatively slow in one direction away from the outlet aperture and means for moving the feed platform relatively fast in the opposite direction; the particulate material being dispensed from said hopper through said outlet aperture onto said feed platform, the feed platform carrying the material therewith as it moves in said one direction and being movable with respect to the material as it moves in the opposite direction.

4,392,596

HOSIERY TRIMMING APPARATUS

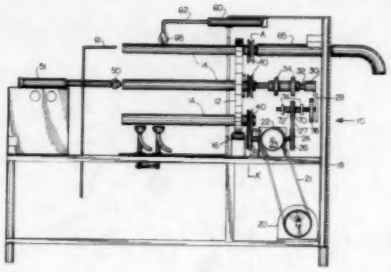
James D. Painter, 2140 Lois St., SE., Cleveland, Tenn. 37311

Filed Feb. 24, 1981, Ser. No. 237,594

Int. Cl.³ A41H *43/02*

U.S. Cl. 223—43 **6 Claims**

1. An apparatus for trimming unfinished threads and flattening a toe seam in a hosiery article comprising: a plurality of elongated tubular members, each said tubular member being hollow and having first and second open ends, each said tubular member being adapted to receive on its exterior a hosiery article with a toe portion of said hosiery article covering said first open end of said tubular member, a turret, each said tubular member being movably mounted adjacent said second open end to said turret, said turret being rotatably driven so that each said tubular member arrives at a plurality of work stations; shear means, said shear means being adjustably placed adjacent one of said work stations so that said hosiery article on said tubular member will expose unfinished threads to said shear means, rotation means, said rotation means being adapted to rotate each said tubular member when each said tubular member arrives at said one of said work stations adjacent said shear means; stretching means, said stretching means being aligned axially with respect to each said tubular member at another of said work stations, said stretching means being adapted to clamp said hosiery article between said stretching means and said first open end of each said tubular member and to stretch said toe seam in a direction parallel to the length of said hosiery article; removal means, said removal means being adjacent to a third one of said work stations and comprising means to urge said hosiery article along each said tubular member towards said first open end of each said tubular member, and compressed air means to supply compressed air to urge said hosiery article through the interior of said tubular member and through said second open end of said tubular



member, said removal means comprising cylinder means mounted adjacent said third one of said work stations parallel to each said tubular member, and friction pad means coupled to said cylinder means and adapted to be driven toward said first open end of each said tubular member in contact with said hosiery article and each said tubular member by said cylinder means, each said tubular member further comprising a sheave member encircling said second open end of each said tubular member, said rotation means comprising a V-belt mounted adjacent said turret and adapted to releasably engage and rotate said sheave member of each said tubular member at said one of said work stations.

4,392,597

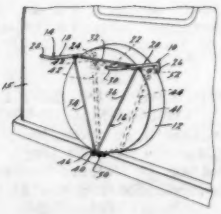
BICYCLE RACK

Hubert L. Traugh, 307 E. Exchange, Owosso, Mich. 48867

Continuation-in-part of Ser. No. 279,717, Jul. 2, 1981, abandoned. This application Feb. 2, 1980, Ser. No. 345,199

Int. Cl.³ B60R *19/02*

U.S. Cl. 224—42.13 **22 Claims**



1. A bicycle rack particularly adapted for use with an exteriorly mounted spare tire on an automotive vehicle, said rack comprising, in combination, a horizontally disposed support section and a vertically disposed base section, means connecting said support section and said base section together, said support section being of generally U-shaped configuration and including a pair of laterally spaced, horizontally extending arms and a transverse portion extending between said arms in

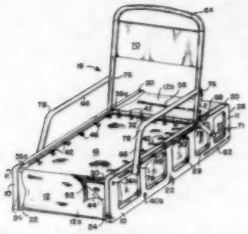
vertically spaced relationship with respect thereto, said base section including a horizontally extending member disposed in horizontally spaced relationship with respect to said transverse portion of said support section whereby a portion of a tire may be received therebetween, said base section also including a pair of oppositely angularly disposed members each having one end portion thereof connected to said support section.

4,392,598

CONVERTIBLE BACKPACK CHAIR

John F. Dixon, 425 California St., Suite 2600, San Francisco, Calif. 94104

Filed Jan. 19, 1982, Ser. No. 340,750
Int. Cl.³ A45F *3/10*
U.S. Cl. 224—155 **10 Claims**



1. A convertible backpack chair comprising:
(a) two parallel rigid panels spaced apart, defining side, top, bottom and end surfaces of a generally rectangular storage volume contained therebetween;
(b) a pack bag comprising at least one compartment located within said storage volume and supported between said rigid side panels by support means;
(c) a pair of shoulder straps for supporting the pack on the shoulders of the user, the straps being provided on the bottom surface of said storage volume;
(d) lumbar support means, provided on the same surface as said shoulder straps; and
(e) a collapsible chair portion and seat portion provided on the opposite surface, said collapsible chair portion comprising:
(i) a generally U-shaped chair back frame,
(ii) a pair of arm rests, one end of each arm rest being pivotally attached to said chair back frame and the other end of each being pivotally attached to said rigid side panels,
(iii) a pair of hinge straps, one end of each being pivotally attached near the ends of said chair back frame and the other end of each being pivotally attached to said rigid side panels, and
(iv) a back support panel attached to said chair back frame.

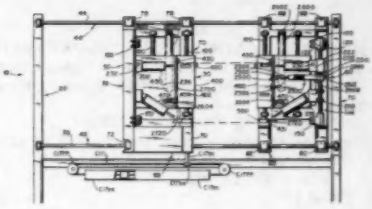
4,392,599

DRAWER BUILDING SYSTEM HAVING FASTENING GUNS

B. Carson Russell, 8137 Chateau Dr., Cherry Bluffs Estate, Egg Harbor, Wis. 54209

Filed Aug. 20, 1980, Ser. No. 179,728
Int. Cl.³ B27M *3/34*; B31B *13/60*
U.S. Cl. 227—40 **1 Claim**

1. A building machine in combination with a vertically oriented drawer, said drawer comprising a drawer front, two vertical drawer side pieces, a drawer bottom and a drawer back, said machine comprising first and second carriages mounted on a frame in a manner for relative movement with respect to each other so as to be closer or farther from each other, said relative movement being along a first axis, primary and secondary sub-carriages movably mounted respectively on said first and said second carriages and moveable in parallelism with a second axis at a right angle to said first axis, there being a drawer space between said carriages during building, fastening guns, first and second sets of shiftable gun holders carrying said guns and disposed on right and left sides of the drawer space, there being a third axis disposed at a right angle to said first axis and also at a right angle to said second axis, the gun holders each being spaced apart with respect to other gun holders of the same set substantially along lines parallel to said third axis, the gun holders being moveably mounted on the carriages for movement in directions parallel to said third axis whereby three dimensional adjustment of the position of each of the guns is possible, means for supporting said drawer front in a horizontal position, said machine having means for pressing said vertical drawer side pieces downwardly against said



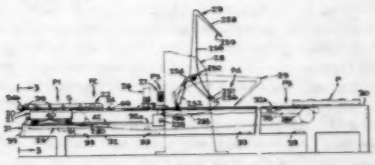
drawer front when said drawer front is in said horizontal position, said vertical drawer side pieces being upstanding from said drawer front when pressed by said means for pressing, said fastening guns comprising right and left fastening guns having their noses closely adjacent right and left outer sides respectively of the drawer side pieces when said drawer side pieces are upstanding from the drawer front, said guns each fastening in at least a partially horizontal direction, said drawer bottom being inserted between the means for pressing, between said fastening guns and between said drawer side pieces whereby the drawer bottom is insertable vertically downwardly when said means for pressing presses the vertical side pieces downwardly against the drawer front and the noses of the fastening guns are closely adjacent the outer sides of the drawer side pieces.

4,392,600

APPARATUS FOR MAKING PALLETS

Ronald J. Billett, Sunnyvale, and Veikko K. Viitanen, San Jose, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 20, 1981, Ser. No. 236,426
Int. Cl.³ B27F *7/02*; B42D *3/00*
U.S. Cl. 227—50 **12 Claims**



1. An apparatus for making pallets comprised of spaced parallel stringers and several deckboards nailed to opposite sides of the stringers in spaced parallel relation and at right angles with the stringers, said apparatus comprising:
means located at a nailing station for consecutively nailing deckboards to a plurality of spaced parallel stringers;
means for intermittently conveying said plurality of spaced parallel stringers from a loading station forwardly toward the nailing station and thereafter in stepped relation

through the nailing station to permit deckboards to be consecutively nailed to the stringers to form a half-pallet; and

means for inverting the half-pallet assembly so that deckboards may be nailed to the other sides of the stringers of the half-pallet assembly, said inverting means including means for releasably and firmly grasping one end of the half-pallet assembly, means for rotatably mounting said grasping means to said means for conveying the stringers to permit the grasping means to rotate the half-pallet assembly about an axis that is transverse to its direction of travel as the half-pallet assembly, and means that engage the free opposite end of the half-pallet assembly for pivoting the half-pallet assembly 180° about said transverse axis of rotation as said grasping means is moved by said conveying means.

4,392,601

TWO-SHIFT AUTOMATIC ASSEMBLING APPARATUS

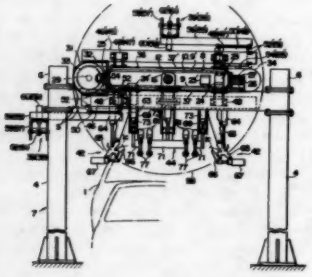
Tsuneo Fujikawa, Ebina, and Haruyoshi Takagishi, Yamato, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 12, 1980, Ser. No. 186,543

Claims priority, application Japan, Sep. 25, 1979, 54-122831; Oct. 24, 1979, 54-136438

Int. Cl.³ B23K *37/04*

U.S. Cl. 228—4.1 **8 Claims**



1. A two-shift automatic assembling apparatus for selectively assembling at least one component member to an incomplete work of a first model or at least one component member to an incomplete work of a second model during each cycle of operation of the apparatus, comprising:

a frame structure for accomodating at least a portion of one of said incomplete works of the first and second models therewithin and for permitting each of the incomplete works to be conveyed in a longitudinal direction therethrough, and

a base structure supported on said frame structure and having two parallel opposite faces, said base structure being rotatable between two diametrically opposite angular positions about an axis fixed with respect to said frame structure and substantially parallel with said two faces of the base structure and with said longitudinal direction, and two sets of assembling fixtures detachably mounted on said two faces, respectively, of the base structure, each set of said assembling fixtures including work gauge means adapted to hold each of said incomplete works in a predetermined position with respect to said frame structure, carrier means adapted to carry each of said component members from the outside of said frame structure into a predetermined position within the frame structure, and parts gauge means adapted to transfer the component member from said predetermined position thereof into a predetermined ready-for-assembly position with respect to the work held in position by said work gauge means.

4,392,602

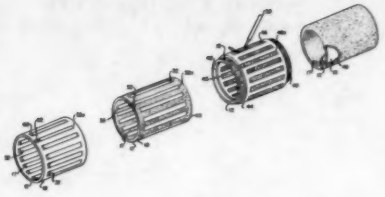
METHOD OF MAKING SANDWICH STRUCTURES BY SUPERPLASTIC FORMING AND DIFFUSION BONDING

Vene L. Darby, Redondo Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 24, 1980, Ser. No. 209,570

Int. Cl.³ B23K *20/18*

U.S. Cl. 228—118 **4 Claims**



1. A method of forming a sandwich structure from a plurality of workpieces comprising:

(a) stacking said plurality of workpieces, each of said workpieces having two opposed principal surfaces;

(b) coating at least one of said principal surfaces with a maskant;

(c) removing said maskant from portions of said at least one coated principal surface that is not to be diffusion bonded;

(d) etching said portions of said at least one coated surface where the maskant has been removed to a depth equal to the thickness of said stopoff material to be applied;

(e) applying a stopoff material to said portions where said maskant has been removed;

(f) removing said remaining maskant from at least one coated principal surface;

(g) placing said workpieces in a die assembly under coordinated temperature-pressure-time conditions;

(h) maintaining said conditions for sufficient time to product diffusion bonding of selected portions of said workpieces; and,

(i) superplastic forming at least a portion of at least one of said workpieces.

4,392,603

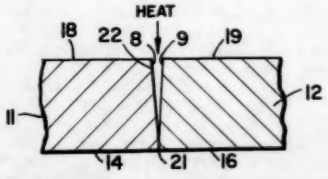
PREPARATION OF PIPE ENDS FOR SOLID PHASE WELDING

Jean La Force, P.O. Box C, Inverness, Calif. 94937, assignor to Carl Stringer, Pearland; Stringer Oil & Gas Co., San Angelo, both of, Tex.; Jean La Force, Inverness, Calif. and Carl Thomas Stringer, Pearland, Tex., a part interest to each

Filed Aug. 4, 1980, Ser. No. 175,279

Int. Cl.³ B23K *5/08, 20/14*

U.S. Cl. 228—196 **2 Claims**



1. The method of solid phase welding adjacent ends of axially aligned large diameter metal pipes in which the confronting faces of the respective pipe sections are brought into contiguous confronting relationship with ambient atmopsheric

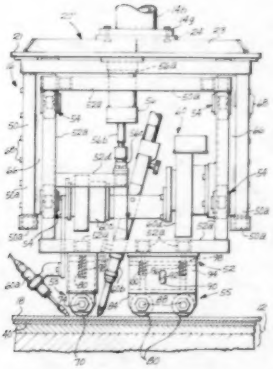
conditions prevailing within the pipe bores, and in which heat by means of external flame burner is applied substantially uniformly around the entire outer periphery of the abutting pipe ends while axial pressure is applied to said sections urging said faces towards each other, the improvement comprising sealing the ambient atmosphere within the pipe bores from the general area of the confronting faces by forming of at least one of said faces whereby the confronting faces are in continuous contact only along and adjacent the entire circumferential extent of the inner bore surfaces of the respective pipes and the confronting faces are spaced from each other other than at the bore surfaces to provide a circumferential gap in adjacent confronting relation to said heating flames, whereby the ambient air oxygen is excluded from said gap and no significant oxidation of the metal will take place thereat.

4,392,604

PANEL WELDING SYSTEM

Stanley L. Sears, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 27, 1980, Ser. No. 181,863
Int. Cl.³ B23K *37/02, 37/04*
U.S. Cl. 228—212 **20 Claims**



1. A welding apparatus for automatically or semi-automatically welding butt seams to join abutting edges of flat workpieces, comprising in combination:

a workpiece supporting bed including vacuum means for releasably holding down the workpieces flat against the bed;

carriage supporting means overlying said bed;

traveling carriage means cooperating with said carriage support means for controlled travel in a plane overlying said bed;

a welding torch and workpiece positioning roller head assembly mounted on said carriage means for traveling therewith relative to said bed, said head assembly comprising:

truck support means fixedly mounted on said carriage means;

truck means coupled to and cooperating with said truck support means for movement of said truck means toward and away from said workpiece supporting bed;

means for controllably moving said truck means relative to said truck support means between a retracted position spaced from said bed and an operative position proximate said bed;

welding torch means mounted on said truck means so as to be disposed for traveling therewith relative to said bed and so that said torch means can be guided along a seam between abutting edges of workpieces held by said bed to form a butt weld therealong;

and a plurality of down pressure roller means mounted on said truck means for rolling contact with workpieces supported on said bed when said torch means is guided along a seam, said down pressure roller means including a leading set of down pressure rollers disposed at a predetermined distance in advance of said torch means, and further including a trailing set of down pressure rollers disposed at a predetermined distance behind said torch means with respect to the direction of travel, said leading and trailing sets of down pressure rollers being sized and said predetermined distances selected so as to contact and apply down pressure to the workpieces at locations distributed over a predetermined, localized traveling zone of welding heat induced distortion on the workpieces, said traveling zone extending ahead and behind and laterally of said welding torch means; and

wherein said plurality of down pressure roller means comprise a plurality of roller support means for mounting said leading and trailing sets of rollers so as to be independently movable toward and away from said truck means, and a plurality of biasing means for reacting against said truck means so as to independently urge said leading set and trailing set of rollers downwardly toward said bed and workpieces thereon when said truck means is moved from said retracted position to said operative position.

15. A method of automatically or semi-automatically welding an elongate stiffener to a substantially flat workpiece, comprising the steps of:

holding such workpiece down against a supporting bed by developing a suction force on the underside of the workpiece;

controllably guiding a welding torch, down pressure and steering roller supporting head assembly along a predetermined stiffener attachment line on an upwardly facing surface of the workpiece so as to form a fillet weld along a lengthwise edge portion of a stiffener that is in contact with said workpiece surface;

exerting an initial down pressure on the stiffener in advance of the forming of said fillet weld by a leading down pressure roller mounted on said head assembly;

laterally steering the stiffener, also in advance of the forming of said fillet weld by exerting inwardly opposing side pressure on the stiffener with laterally movable steering rollers disposed downstream of the leading down pressure roller; and,

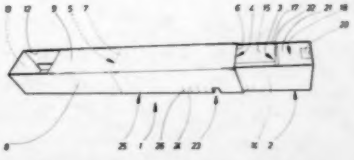
exerting a final down pressure on the stiffener at a location adjacent to the point of formation of the fillet weld by a trailing down pressure roller mounted on said head assembly.

4,392,605

PACKAGE

Erik Backman, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Jul. 15, 1981, Ser. No. 283,457
Claims priority, application Sweden, Jul. 22, 1980, 8005301
Int. Cl.³ B65D *5/38, 13/06*
U.S. Cl. 229—19 **10 Claims**



1. An adjustable, relockable package, comprising:

first and second package parts displaceable axially from one another for opening and closing the package and for adjusting the size of the package to an article to be packaged therein;

the first package part having at least a first wall and the

second package part having at least a second wall, the first and second walls being slidably disposed adjacent one another;

the first and second walls having a plurality of cuts, the cuts defining a plurality of locking elements and forming abutment edges, transverse to the displacement directions, when any of the locking elements of the first and second parts are together pressed into a locking position, in which the pressed-in locking elements in the first package part engage abutment edges of the second package part resulting from locking elements of the second package part being pressed in; and,

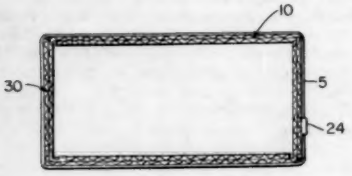
one of the first and second walls having an extended series of the cuts, uniformly spaced from one another, and the other of the first and second walls having at least four of the cuts, spaced from one another by whole number multiples, including one, of the uniform spacing of the extended series of cuts, whereby said first and second package parts can be locked together in the same axial position by the displacement inwardly of any one of three adjacent locking elements.

4,392,606

PRE-BANDED BULK PACK CONTAINER

Edwin A. Fremion, Cleveland, Tenn., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,555
Int. Cl.³ B65D *19/06, 19/20*
U.S. Cl. 229—23 R **6 Claims**



1. A bulk pack container adapted to be supported by a pallet or the like comprising, in combination, a body portion and a pair of first and second end caps, said body portion comprising side walls formed from a pair of rectangular wall forming blanks of material that are unsecured with respect to one another, said blanks having coterminous upper and lower edges and unsecured ends and being scored to provide at least four panels, said blanks being nested and interleaved with like panels overlapping one another so that the ends of each respective blank are separated from one another by a corner of the other respective blank to form a reinforced structure, and at least two bands of strapping material arranged around the outer periphery of said body portion in the knocked down condition, said bands being adapted to restrain the side walls and keep the side walls from bulging outwardly when the container is filled.

4,392,607

CARTON WITH INTEGRAL CLOSURES

David Perkins, Jr., Des Moines, Iowa, assignor to Corrugated Drum Systems, Inc., Cedar Rapids, Iowa

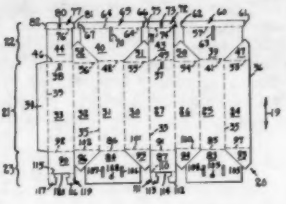
Continuation-in-part of Ser. No. 220,764, Dec. 29, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 359,869
Int. Cl.³ B65D *5/10*
U.S. Cl. 229—39 R **4 Claims**

1. A carton having an integral self-locking end closure, comprising, in combination:

a carton body having pairs of opposite panels integral along longitudinal fold lines;

outer flaps integral along first transverse fold lines with the panels of a first pair and along second transverse fold lines with first tab strips having central slots and first outward lock tabs, the panels of said first pair having medial lock slots near said first fold line; and

inner flaps integral along third transverse fold lines with the panels of a second pair and along fourth transverse fold lines with second tab strips having second outward lock tabs, said inner flaps having center slots terminating near said fourth transverse fold lines,



so that when said inner flaps are folded in the same direction on said third and fourth transverse fold lines said second lock tabs are received in said lock slots of said first pair of panels to pass outward therethrough,

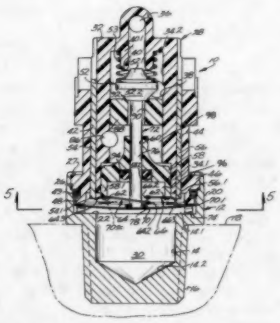
and when said outer flaps are then folded in the same direction on said first and second transverse fold lines, said central slots of said first tab strips receive said second tab strips, and said first lock tabs are received in said center slots of said inner flaps to pass inwardly therethrough.

4,392,608

THERMALLY RESPONSIVE FLUID AND ELECTRICAL SWITCH AND CONTROL SYSTEM

Brian J. Blades, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 3, 1979, Ser. No. 99,295
Int. Cl.³ G05D *23/10*
U.S. Cl. 236—48 R **7 Claims**



1. A thermally responsive fluid and electrical switch comprising

a first thermally conductive metal housing means having an open-ended well therein,

a second housing means having an open-ended well and having port means opening into the well, the second housing means being secured to the first housing means so that the wells cooperate to form a switch chamber therebetween,

electrical terminal means extending into the switch chamber,

thermally responsive means also disposed in the switch chamber in close heat-transfer relation to the first housing means for movement in response to selected changes in temperature,

valve means also disposed in the switch chamber actuable by movement of the thermally responsive means for regulating fluid flow in the port means in accordance with said changes in temperature, and

electrical contact means also disposed in the switch chamber actuable with the valve means for regulating electrical current flow in the terminal means in accordance with said selected changes in temperature.

4,392,609

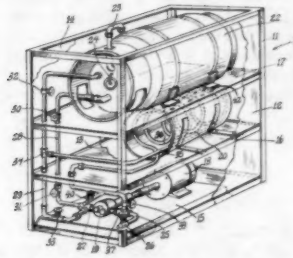
PORTABLE PREHEATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Eugene E. Conterio, 445 Hillcrest Dr., Wilmette, Ill. 60091

Filed Jan. 21, 1981, Ser. No. 226,558

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 C **1 Claim**



1. A portable preheating apparatus for internal combustion engines comprising:

(a) a portable cabinet-like housing internally compartmentalized by a plurality of horizontally disposed parallel shelves,

(b) a liquid reservoir in one of said compartments,

(c) a heating chamber housing heating coils for heating liquid in said reservoir as well as liquid in the engine to be preheated, in another of said compartments,

(d) a pump common to said reservoir and said heating coils in yet another of said compartments,

(e) said pump having an inlet and an outlet each in communication with said liquid reservoir and said heating coils as well as the engine to be preheated,

(f) a series of pipe conduits within said housing connecting said inlet and said outlet of said pump to said heating coils, said liquid reservoir, and the engine to be preheated,

(g) a series of valves interposed in said pipe conduits connecting said inlet and said outlet of said pump to said heating coils completing a course for recycling of the fluid by said reservoir between said liquid reservoir and said heating coils,

(h) a second series of valves interposed in said pipe conduits connecting said inlet and said outlet of said pump to said heating coils and said liquid reservoir and the engine to be heated completing a course of circulation of the liquid by said pump between said heating coils and said reservoir and the engine to be heated, and

(i) a third series of valves interposed in said pipe conduits connecting said inlet and said outlet of said pump to said heating coils and the engine to be heated completing a course of recycling of the liquid by said pump between said heating coils and the engine to be heated.

4,392,610

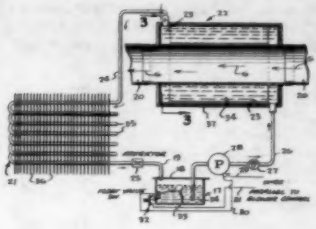
HEAT SCAVENGER

John F. Moskal, Box 266, Nanjemoy, Md. 20662

Filed Apr. 2, 1980, Ser. No. 136,673

Int. Cl.³ F24B *7/00*

U.S. Cl. 237—5 S **5 Claims**



1. For use with an existing heating system including a furnace having an air intake for admitting cold air into the furnace, air outlet means for distributing air exiting from said furnace, and a flue pipe defining an exhaust path to the ambient of undesired combustion gases, a portable readily detachable heat scavenger comprising:

means for absorbing heat from said flue pipe;

heat exchange coil means for radiating heat located in said cold air downstream of said air intake;

a reservoir tank mounted externally of said furnace;

means for interconnecting said absorbing means, said coil means and said reservoir tank;

said reservoir tank, said absorbing means, said coil means and all of said interconnecting means containing heat exchange fluid;

pump means for moving said fluid through said interconnecting means;

said interconnecting means including restrictor means, positioned downstream of said coil means, for maintaining flow of said fluid therefrom at a constant rate, said restrictor means being chosen so that the time of travel of said fluid through said coil means is maximized, said restrictor means further being positioned upstream of said reservoir tank and discharging directly thereinto;

said absorbing means including inner and outer concentric shell members, said inner member being in direct contact with said combustion gases, as well as in line with, and concentrically secured to said flue pipe, said inner and outer members defining therebetween a chamber through which said heat exchange fluid flows.

4,392,611

SPRAYER CONTROL SYSTEM

Wesley J. Bachman, and Robert C. Funk, both of Auburn, Ill., assignors to Dickey-john Corporation, Auburn, Ill.

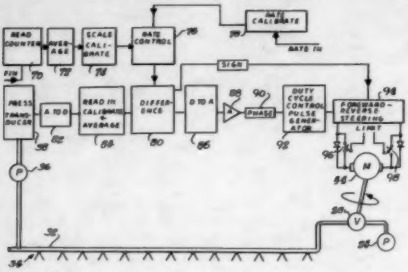
Filed May 15, 1981, Ser. No. 264,147

Int. Cl.³ A01M *7/00*; B05B *9/06*

U.S. Cl. 239—74 **21 Claims**

1. An automatic control system for a vehicular liquid sprayer which pumps liquid at a desired pressure to a plurality of nozzles which dispense liquid at a desired volume per unit area application rate, said application rate being a function of predetermined properties of said vehicular liquid sprayer and of the liquid, said control system comprising: pressure sensing means for sensing the instantaneous pressure of the liquid supplied to said nozzles and for producing a corresponding pressure electrical signal, means for measuring the ground speed of said vehicular liquid sprayer and for producing a corresponding ground speed electrical signal, control circuit means for receiving said pressure signal and said ground speed signal, operator accessible control means for delivering to said control circuit means input electrical signals corresponding to a de-

sired application rate, to the number of nozzles associated with said vehicular liquid sprayer and to the nozzle spacing, said control circuit means being responsive to said pressure signal, said ground speed signal and said input signals for calculating a desired pressure of the liquid supplied to said nozzles necessary to achieve said desired application rate and for calculating the difference between said desired pressure and said instantaneous pressure and producing a first output control signal of a magnitude corresponding to the difference between said desired pressure and said instantaneous pressure and a second



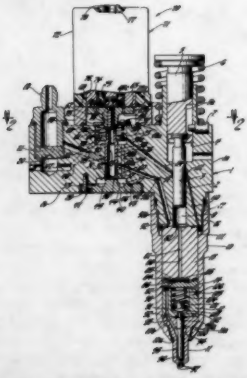
output control signal corresponding to the sign of said difference, duty cycle control means for converting said first output control signal to a cyclical control signal of a fixed period whose duty cycle varies in proportion to the magnitude of said first output control signal and pressure control means responsive to said cyclical control signal and to said second output control signal for varying said instantaneous pressure in the amount and direction necessary to equal said desired pressure to thereby achieve and thereafter maintain said desired application rate.

4,392,612

ELECTROMAGNETIC UNIT FUEL INJECTOR

John I. Deckard, Grand Rapids, and Robert D. Straub, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1982, Ser. No. 350,267
Int. Cl.³ F02M *55/00, 51/00*
U.S. Cl. 239—88 **2 Claims**



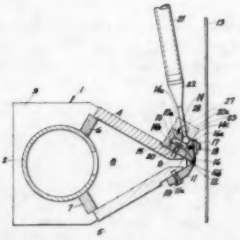
1. An electromagnetic unit fuel injector including a housing means having a fuel passage means connectable at one end to a source of fuel for the ingress or egress of fuel at a suitable supply pressure, a supply chamber and a spill chamber positioned in spaced apart relationship to each other and in flow communication with said fuel passage means, a pressure relief passage interconnecting said chambers and a valve stem guide bore extending between said chambers with a conical valve seat encircling said guide bore at the spill chamber end thereof; a pump cylinder means in said housing means; an externally actuated plunger reciprocable in said cylinder means to define therewith a pump chamber open at one end for the discharge of fuel during a pump stroke and for fuel intake during a suction stroke of said plunger; said housing means including a valve body having a spray outlet as one end thereof for the discharge of fuel; an injection valve means movable in said valve body to control flow from said spray outlet, a discharge passage means connecting said pump chamber to said spray outlet; and a solenoid actuated, poppet valve controlled passage means for effecting flow communication between said pump chamber and said fuel supply chamber and including a solenoid actuated poppet valve having a head with a stem extending therefrom journaled in said valve guide bore for reciprocable movement whereby said head is movable between an opened position and a closed position relative to said valve seat, said stem having a reduced diameter stem portion next adjacent said head which defines with said valve stem guide bore an annulus portion of said valve controlled passage means; and, a solenoid means operatively connected to said housing means, said solenoid means including an armature and a spring positioned in said supply chamber and operatively connected to said poppet valve with said spring positioned to normally bias said poppet valve to said open position.

4,392,613

DISCHARGE GAP CLEANING DEVICE

Hart F. Graff, and Karl T. Bagdal, both of Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Dec. 22, 1980, Ser. No. 218,676
Int. Cl.³ B05B *15/02*
U.S. Cl. 239—115 **10 Claims**



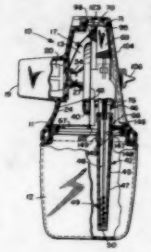
1. A device for cleaning the discharge gap of a jet nozzle of the type used in conjunction with a web coating line and constituting an elongated nozzle structure located in close proximity to the coated web and extending transversely of said coated web with its ends extending beyond the edges of said coated web and its discharge gap also extending transversely of said coated web and being of a length greater than the width of said coated web, said cleaning means comprising a body member, means to shiftably mount said body member in a path of travel extending parallel to and along the length of said jet nozzle, a clean-out blade on said body member, said clean-out blade having a free end extending into said jet nozzle discharge gap and remaining there at all times, and means to shift said body member back and forth along said path of travel, said cleaning means being located at one end or the other of said discharge gap when not being shifted along said path of travel.

4,392,614

PORTABLE PAINT SPRAYER

Hugh F. Groth, Brecksville, and John D. Vogel, Sagamore Hills, both of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Jan. 12, 1981, Ser. No. 224,635
Int. Cl.³ B05B *3/08*
U.S. Cl. 239—215 **60 Claims**



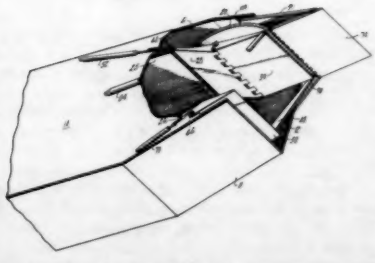
1. A portable pump spraying device comprising a container for the liquid to be sprayed, a sprayer housing connected to said container, said housing containing a spray chamber having a vertically oriented spray discharge slot, a vertically oriented spinner disc in said spray chamber, pump means for pumping the liquid to be sprayed from said container onto said spinner disc, said pump means including a lower generally vertical pump tube portion extending into said container, a conveyor screw coaxially and rotatably disposed within said lower pump tube portion, and an upper pump tube portion having a right angle bend extending generally perpendicular to the spinner disc axis, drive means for rotating said spinner disc, and a flexible torsion-resistant transmission shaft drivingly axially connecting said spinner disc and said conveyor screw through said upper and lower pump tube portions, said upper pump tube portion having a delivery orifice opening toward the face of said spinner disc for delivering the pumped liquid onto said spinner disc, the rotation of said spinner disc being operative by centrifugal force to form a spray from the liquid delivered thereto and impel a portion of the spray through said spray discharge slot.

4,392,615

VIOL EXHAUST NOZZLE WITH VEER FLAP EXTENSION

William M. Madden, Palm Springs, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 11, 1981, Ser. No. 262,367
Int. Cl.³ F02K *1/12*
U.S. Cl. 239—265.37 **7 Claims**



1. A two-dimensional variable area exhaust nozzle assembly for a gas turbine engine having forward and vertical thrust capability including:

convergent/divergent variable position exhaust nozzle means including exhaust duct means having opposed side walls, and movable upper and lower flap means disposed between said side walls, said exhaust duct means and upper and lower flap means defining a converging-/diverging exhaust gas flow path, said upper flap means including a downstream flap having an exhaust gas expansion surface and a fore and an aft edge, said aft edge being movable from a first to a second forward thrust position in a circular arc about a fixed axis parallel to said aft edge;

deflector hood means rotatable in a circular arc about said fixed axis between a plurality of stowed positions wherein it is above said upper flap means external to the gas flow path and a deployed position downstream of said upper flap means in said gas flow path to deflect exhaust gases in a downward direction, said hood means having rear edge parallel to said downstream flap aft edge;

a veer flap having a front edge, a rear edge, and a gas directing surface, said veer flap being pivotally connected at its front edge to said hood means rear edge and, during forward thrust operation of said nozzle assembly, extending in a generally downstream direction;

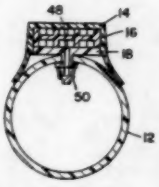
first actuation means operatively connected to said convergent/divergent nozzle means, to said hood means, and to said veer flap for positioning said convergent/divergent nozzle means, said hood means, and said veer flap, including control means for rotating said hood means to continuously maintain the position of said front edge of said veer flap adjacent said aft edge of said downstream flap during forward thrust operation of said nozzle assembly, wherein during forward thrust operation said gas directing surface of said veer flap acts as an extension of said downstream flap expansion surface.

4,392,616

SELF-PERFORATING DRIP IRRIGATION DEVICE

Donald O. Olson, 5885 Dartmouth St., Chula Vista, Calif. 92010

Filed Apr. 6, 1981, Ser. No. 251,157
Int. Cl.³ B05B *15/06, 15/00*
U.S. Cl. 239—271 **3 Claims**



1. In an emitter adapted for attachment to a conduit of yieldable, flexible material in a drip irrigation system, said emitter comprising a housing having inlet and outlet means and means within the housing forming a tortuous fluid path for reducing fluid pressure between said inlet and outlet means, said inlet means comprising:

an inlet fitting extending from said housing having a tubular shank portion with a central passage which connects with said tortuous fluid path;

a frusto-conical barb portion integral with said shank portion and spaced below an outer surface of said emitter housing from which said shank portion extends, said barb portion having an upper end with a diameter greater than said shank portion, at least one opening in said barb portion forming a passage through said inlet fitting to said central passage of said shank portion; and

a rigid cylindrical end portion extending from the smaller, lower end of said barb portion having a substantially flat

end face forming a well defined peripheral edge, the length of said cylindrical end portion and its said peripheral edge serving to sever the wall of a said conduit to remove a portion of conduit material and thereby form a circular opening therein when the emitter with said inlet fitting is attached to the conduit by being pressed against it.

4,392,617

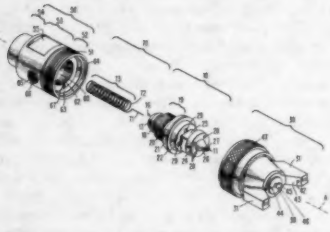
SPRAY HEAD APPARATUS

Peter Bakos; Russell E. Darrow, both of Endicott; Joseph Funari, Vestal, and Diane L. Redpath, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,025

Int. Cl.³ B05B 1/26

U.S. Cl. 239—290 5 Claims



1. Non-electrostatic spray head apparatus for spraying a layer of photoresist material on the surface of a predetermined circuitizable workpiece, said layer being subsequently finalized as a photoresist mask for coacting with said surface to circuitize said workpiece, said apparatus comprising:

nozzle means having at least one discharge orifice for discharging a predetermined fluid of said material,

a non-electrically connected springlike member having plural coils compressively housed within said nozzle means, said coils having a longitudinal first axis, said member having a longitudinal elongated vibratile extension integral with an end coil of said springlike member, said extension having a longitudinal center second axis and being disposed in said hollow tip and protruding outwardly from said orifice to discharge said photoresist fluid from said orifice as a hollow-shaped stream, said first and second axes being colinear, said fluid being discharged from said orifice along said extension, and a source of pressurized propellant for providing said pressurized propellant external to said orifice to intercept the discharged said fluid, said hollow-shaped stream of said discharged fluid coacting with said intercepting propellant to vibrate said extension transverse to said longitudinal center axis, the vibrations of said extension in combination with said intercepting propellant and said hollow-shaped stream coacting to atomize said fluid into a spray having a uniform distribution characteristic to apply said layer with a substantially uniform thickness on said surface.

4,392,618

LIQUID-PROJECTING MONITOR

John L. Evans, Camberley, and Kuldip Bains, Slough, both of England, assignors to Chubb Fire Security Limited, Middlesex, England

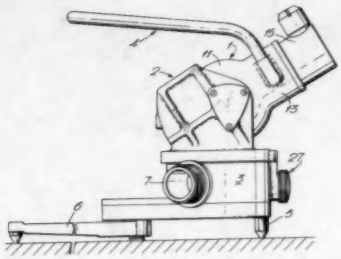
Filed Mar. 13, 1981, Ser. No. 243,305

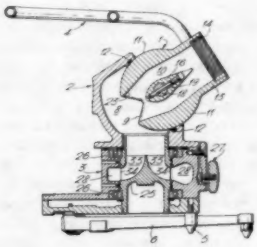
Claims priority, application United Kingdom, Mar. 13, 1980, 8008524

Int. Cl.³ B05B 1/26

U.S. Cl. 239—461 8 Claims

1. A liquid-projecting monitor comprising a housing, and a head for carrying a nozzle; the head having a frusto-spherical external surface and having a passage within the head for liquid flow to the nozzle; the housing defining together with the head a chamber from which liquid is led into said passage within the head and thence to the nozzle; an axle passing transversely through the width of the head to support the head for pivotal movement relative to the housing about a generally horizontal axis so as to provide adjustment of the angular elevation or depression of the head; the frusto-spherical surfce of the head





forming a sliding seal against the housing to maintain the aforesaid chamber liquid-tight throughout the permitted range of said pivotal movement; a body extending transversely across the interior of the head to enclose said axle and to define in part the confines of said passage; and the head being so configured that the cross-sectional area of said passage within the head which is available for liquid flow is at least approximately constant throughout the length of said pressure.

4,392,619

AUTOMATIC ROLL-UP DEVICE FOR A SAFETY BELT

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,179

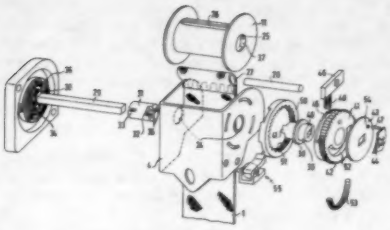
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009701

Int. Cl.³ A62B 35/02; B65H 75/48

U.S. Cl. 242—107.2 11 Claims

1. Automatic roll-up device and belt arresting device for retarding movement of a safety belt of a vehicle and for arresting movement of the safety belt, which comprises a housing for the roll-up device, a rotatable belt roller shaft mounted in the housing, a belt roller on which the belt is wound mounted on the belt roller shaft, a retarding mechanism for retarding unwinding of the belt comprising a control disc with control teeth at its periphery freely rotatable relative to the belt roller shaft, a vehicle sensitive actuating sensor which is actuated when the vehicle exceeds a permissible acceleration or deceleration for impeding rotation of the control disc by contact with said control teeth, a spring supported by the control disc, driver means rotatable with the belt roller shaft which, after rotation of said control disc is impeded, rotates against the

force of said spring around a predetermined angular path to retard movement of the belt while permitting withdrawal of the belt, outer teeth affixed to the housing around the control disc, and a belt sensitive actuating sensor in the form of an inertial mass carried by the control disc for impeding rotation



of the control disc by contact with said outer teeth, a belt arresting device through which the belt from said roll-up device passes, and arresting means in said belt arresting device to arrest the belt upon change in movement of the belt therethrough due to retarding the belt by the retarding mechanism.

4,392,620

EMERGENCY LOCKING RETRACTOR FOR A VEHICLE OCCUPANT RESTRAINT BELT

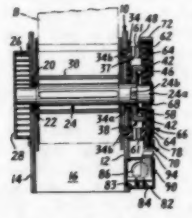
Juichiro Takada, 3-12-1 Shinmachi, Setagayaku, Tokyo, Japan

Filed May 28, 1981, Ser. No. 267,890

Claims priority, application Japan, Jun. 2, 1980, 55-72737; Jun. 2, 1980, 55-72738

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **5 Claims**



1. An emergency locking retractor for a vehicle occupant restraint belt including a frame, a belt reel having a shaft mounted for rotation in the frame, a rewinding spring urging the reel shaft to rotate in a direction to wind the belt onto the reel and a reel locking mechanism located adjacent a side portion of the frame characterized in that the locking mechanism comprises a circular row of equally spaced apart first locking ratchet teeth on the outer face of said side portion of the frame and disposed concentrically to the axis of rotation of the reel shaft, a flange affixed on a reel shaft portion located outwardly of said frame side portion, an inner disc received on said shaft portion outwardly of the flange for limited axial movement toward and away from the flange and having a row of second locking ratchet teeth engageable with the first locking ratchet teeth upon movement of the inner disc toward the frame, an inertia spring engaging the inner disc and urging it in a direction away from the flange, an outer disc received on said shaft portion outwardly of the inner disc and retained thereon against movement in a direction axially of the shaft away from the frame, coacting cam elements on the inner and outer discs adapted to cam the inner disc toward the frame upon rotation of one of the discs relative to the other, one of the discs being coupled to the shaft for rotation conjointly therewith and the other disc being rotatably carried on said shaft portion and having an inertia that causes it to lag the rotation of the disc that rotates with the shaft so that the inner disc is thereupon shifted toward the frame by the cam elements, and the flange having lugs received in corresponding slots in the inner disc and adapted to lock the reel shaft to the inner disc when the inner disc is locked to the frame by the locking ratchet teeth.

4,392,621

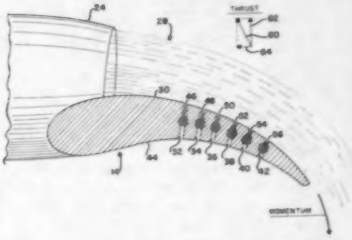
DIRECTIONAL CONTROL OF ENGINE EXHAUST THRUST VECTOR IN A STOL-TYPE AIRCRAFT

Hermann Viets, 144 Scenery Dr., Morgantown, W. Va. 26505

Filed Apr. 7, 1981, Ser. No. 251,695

Int. Cl.³ B64C *21/08*

U.S. Cl. 244—12.5 **9 Claims**



1. In a short takeoff and landing aircraft having at least one wing and a jet engine mounted above and forward of the wing so as to blow its exhaust stream over an upper surface of the wing, a method of controlling the direction of the thrust vector of the engine exhaust stream, comprising the steps of:

(a) deflecting the exhaust stream of said engine over said upper surface of the wing and toward the ground by Coanda effect attachment of said exhaust stream to said upper surface, said deflecting of the exhaust stream increasing the vertical component and decreasing the horizontal component of the thrust vector of said engine exhaust stream and thereby increasing lift of said aircraft; and

(b) controllably detaching said exhaust stream from said upper surface by introducing a flow of air between said exhaust stream and said upper surface at selected ones of a plurality of successive locations, spaced apart along said upper surface of said wing directly behind said engine and aligned in a series between the same and a rear edge of said wing, for varying the position, starting from a region of said upper surface near said rear edge of said wing and remote from said engine and progressing forwardly along said upper surface toward said engine, at which said exhaust stream becomes detached from said upper surface, said detaching of said exhaust stream increasing the horizontal component and decreasing the vertical component of the thrust vector of said engine exhaust stream and thereby increasing forward acceleration of said aircraft.

4,392,622

COMBINED BEAM SUPPORT FOR LANDING GEAR

John R. McClaflin, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1980, Ser. No. 218,772

Int. Cl.³ B64C *25/10*

U.S. Cl. 244—102 A **14 Claims**

1. In an aircraft, an improved landing gear mount comprising:

an aircraft body frame;

a wing spar extending laterally outwardly from said body frame;

a cantilever beam projecting rearwardly from the wing spar and extending inwardly towards the body frame;

a landing gear support beam positioned rearwardly of the wing spar and extending between the cantilever beam and the body frame;

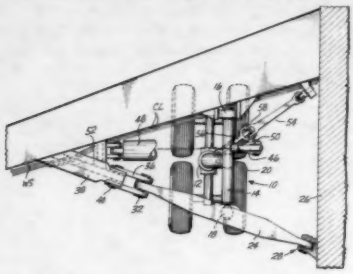
means connecting the inboard end of said landing gear support beam to the body frame including a first pin connection;

a second pin connection between the outboard end of the landing gear support beam and the cantilever beam, said second pin connection being spaced both rearwardly and towards the body frame from said wing spar;

a landing gear including a main strut, wheel means at the lower end of the main strut, and a trunnion at the upper end of the main strut;

a forward bearing for the trunnion mounted on the wing spar; and

an aft bearing for the trunnion mounted on the landing gear support beam.



4,392,623

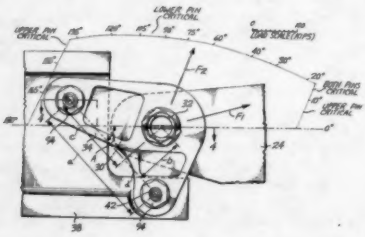
FUSED CONNECTION ADAPTED TO FAIL UNDER DIFFERENT OVERLOADS ACTING IN DIFFERENT DIRECTIONS

Victor A. Munsen, Seattle, and John R. McClaflin, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1980, Ser. No. 218,957

Int. Cl.³ B64C *25/10*

U.S. Cl. 244—102 R **21 Claims**



1. A fused single pin connection between two structural members, comprising:

connector plate means separate from said structural members;

a main attach pin connecting said connector plate means to one of said structural members; and

a pair of shear pins connecting said connector plate means to the other structural member, with the shear pins being positioned such that differences in the direction of applied load on the connector plate means changes the load distribution to the two shear pins.

15. In an aircraft, a generally horizontally extending landing gear beam for supporting the rear end of a landing gear trunnion, said beam including pivot pin means connecting its inboard end to a body frame portion of an aircraft and its outer end to a wing frame means, and the improvement comprising a fused single pin connection between the outboard end of said beam and the wing frame means, comprising:

connector plate means;

a main attach pin connecting said connector plate means to the outboard end of said beam; and

a pair of shear pins connecting said connector plate means to the wing frame means with the shear pins being sized and positioned relating to each other and the main attach pin such that before failing the connection can withstand a substantially larger load in a generally horizontal direction than in a generally vertical direction.

4,392,624

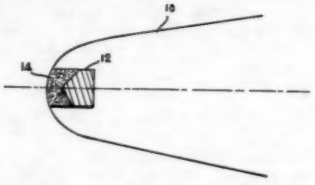
IMPLANTED BOUNDARY LAYER TRIP

Robert J. Myer, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1981, Ser. No. 232,094

Int. Cl.³ B64G *1/58*

U.S. Cl. 244—158 A **6 Claims**



1. A re-entry nose cone comprising a first and a second element; said first element being composed of a first carbon-carbon composite ablative material having a recess in the forwardmost portion; and said second element including a pair of components, one of the components of said pair of components being in the form of an implant positioned in said recess and being composed of a second carbon-carbon composite ablative material characterized by having a different density than that charactrerized by said first ablative material, and a surface roughness greater than that of said first ablative material, the other component of said pair of components forming a forward cap section for said implant and being composed of a third carbon-carbon composite ablative material characterized by having a density and surface roughness similar to that characterized by said first ablative material; whereby said nose cone exhibits a symmetrical erosion profile during its re-entry regime.

4,392,625

CIRCUIT ARRANGEMENT FOR A TRACK CIRCUIT WITH MULTIPLE SIGNAL SOURCES

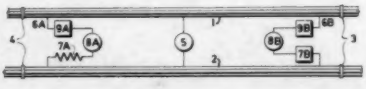
Oldrich Poupě, Žilina, Czechoslovakia, assignor to Vysoka skola dopravy a spojov, Žilina, Czechoslovakia

Filed Apr. 3, 1981, Ser. No. 250,594

Claims priority, application Czechoslovakia, Apr. 4, 1980, 2339-80

Int. Cl.³ B61L *21/06*

U.S. Cl. 246—34 CT **4 Claims**



1. A circuit arrangement for determining the presence of a rail vehicle on a section of track having at least two rails, said circuit arrangement comprising a main signal transmitter coupled to said rails for introducing a main signal thereon, a cross impedance shunting said rails, an additional transmitter for supplying an auxiliary signal and a main receiver for receiving

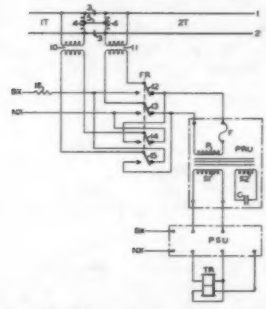
the signals from said main and additional transmitters, said additional transmitter and said main receiver being connected in series with respect to the track of the main signal and being positioned along said track section, with said cross impedance, at a first information point located at a predetermined distance from said main transmitter, whereby the presence of a rail vehicle on said track section additionally shunts said rails thereby reducing the level of said main signal which is then indicated by said receiver.

4,392,626

VITAL PROTECTION ARRANGEMENT FOR RAILROAD TRACK CIRCUITS

Robert D. Pascoe, Upper St. Clair Township, Allegheny County, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Sep. 14, 1981, Ser. No. 301,619
Int. Cl.³ B61L *21/06, 25/00*
U.S. Cl. 246—34 R **6 Claims**



1. A vital protection arrangement for alternating current track circuits in an electrified railroad with propulsion current return through the rails, each track circuit including a receiver at one end for registering the occupancy condition of the corresponding track section in accordance with the presence or absence of track current of selected characteristics, comprising,

(a) a transformer having a primary, secondary, and third winding with said secondary winding coupled to said track circuit receiver,

(b) a fuse having a preselected capacity coupled in series with said primary winding to the track section rails for receiving the current flowing in said rails, and

(c) a capacitor connected across said third winding and having a selected value to resonate with said primary winding at the track circuit frequency,

(d) said primary-capacitor resonant circuit network presenting a high parallel impedance at track circuit frequency, for passing track circuit current through said secondary winding to said receiver without exceeding the capacity of said fuse, and a low impedance at other frequencies, and

(e) said fuse interrupting the circuit network to said receiver when propulsion current flowing in said primary winding exceeds the preselected capacity of said fuse.

4,392,627

DISMANTLEABLE BOAT CRADLE

Frederik H. van den Broek, 48 Willem Klooslaan, Hillegom, Netherlands

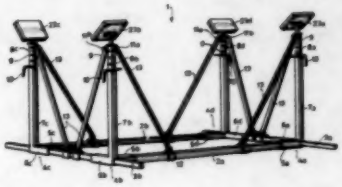
Filed Oct. 24, 1980, Ser. No. 200,588
Int. Cl.³ F16M *11/00*
U.S. Cl. 248—176 **15 Claims**

1. A boat cradle, comprising:

a frame having the form of a closed rectangle and being constructed from profile sections which define the four sides of the rectangle, the four sides of the rectangle meeting at four corners of the frame;

at least two of the corners of the frame, a respective coupling being provided; each coupling comprising a first tube section for receiving the profile section located at a first side of the frame, a second tube section for receiving the profile section located at a second side of the frame which side is perpendicular to the first side of the frame, and a third tube section extending upright from the frame;

at least one of the first and the second tube sections being open at its both opposite ends for enabling the respective profile section received in that tube section to be passed completely through that tube section as the position of



that tube section is adjusted along that profile section, and the first tube section being adjustable along the respective profile section received therein;

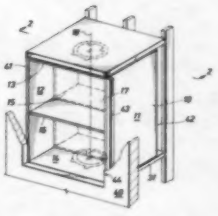
an upright supported by the third tube section and having a support head thereon for supporting thereon a keel of a boat.

4,392,628

CONCEALED ACCESS FURNITURE

Frederick C. Hadfield, 5225 Hollister, Houston, Tex. 77040, and Marvin R. McElroy, 25240 F.M. 2978, Houston, Tex. 77375

Filed Jul. 21, 1981, Ser. No. 285,490
Int. Cl.³ A47B *96/06*
U.S. Cl. 248—202.1 **4 Claims**



1. A system for mounting a rotatable frame member with respect to a vertical wall member comprising:

an elongated, rectangularly shaped frame member having vertical side walls and horizontal top and bottom walls where the side edges of said walls define at least one forward edge surface lying in a vertical plane,

a vertical axis extending through said top and bottom walls and being parallel to the vertical plane defined by said forward edge surface,

a forward vertical wall member,

upper and lower horizontal support members attached to said forward vertical wall member,

first plate members respectively attached to said upper support member and said top wall of said frame member, and second plate members respectively atiached to said lower support member and said bottom wall of said frame members,

rotational means on each of said plate members aligned with respect to said vertical axis for permitting rotation of said

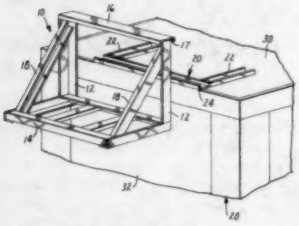
frame member for at least 180° about said vertical axis while providing vertical stability for said frame member, said rotational means having means for locking said plate members relative to one another at 180° positions, said locking means being operative upon horizontal movement of said plate members on said frame member relative to the plate members on said support members.

4,392,629

MOUNTING SYSTEM

Brian L. Dallman, P.O. Box 248, Second & Elm, Hudson, Wis. 54016

Filed Jul. 27, 1981, Ser. No. 287,290
Int. Cl.³ A47B *96/06*
U.S. Cl. 248—205 R **5 Claims**



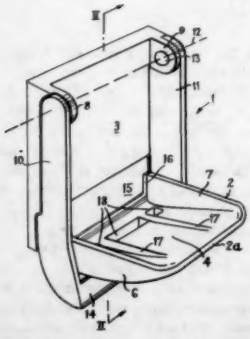
1. A mounting system comprising:
(a) a support rack having upright members and a horizontal shelf supported thereby, wherein a hook member is attached to the upper portion of said upright members, and
(b) a rack fastener which is adapted to be fastened to a support surface, wherein said rack fastener includes a horizontally disposed member which is adapted to engage and support said hook member of said support rack, wherein said horizontally disposed member spans substantially the full width of said support rack.

4,392,630

SOAP HOLDERS

Hussain A. Moontasir, 2 High Park Rd., Kew Gardens, Surrey, England

Filed Oct. 14, 1980, Ser. No. 196,326
Claims priority, application United Kingdom, Oct. 12, 1979, 7935597
Int. Cl.³ A47K *5/08*
U.S. Cl. 248—309 R **6 Claims**



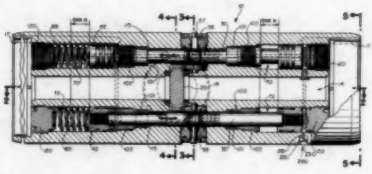
1. A soap holder comprising, in combination:
(a) a tray-like member having a base part for holding a bar of soap on one surface thereof,
(b) means for mounting said tray-like member in a generally horizontal position projecting from back to front of said soap holder and with said base part surface facing upwardly,
(c) push means located closely above said base part surface of said tray-like member,
(d) means mounting said push means for reciprocating movement between a rest position at the back of said tray-like member and the front thereof, and
(e) actuating means located below said tray-like member and adapted to move said push means,
(f) said actuating means being operable to advance said push means towards said front of said tray to dispense said bar of soap from said front thereof, whereby said bar can be delivered into the palm of a user's hand operating said actuating means.

4,392,631

SUB-SURFACE SAFETY GATE VALVE

Jack J. DeWald, 7323 W. Roadway, New Orleans, La. 70124

Filed Jul. 26, 1979, Ser. No. 61,076
Int. Cl.³ F16K *31/16*
U.S. Cl. 251—58 **15 Claims**



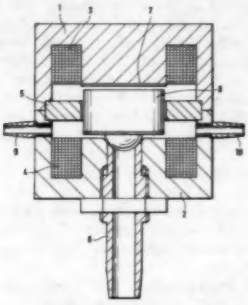
1. A high pressure gate valve apparatus comprising:
a. an elongated valve body having a longitudinal axis providing a flow conveying cylindr.cal longitudinal bore having an axis parallel to the axis of said body;
b. a gate valving member movable within the confines of said valve body at generally right angles to and intersecting said flow conveying bore and having a flow opening corresponding in size to said bore, said gate valving member being movable within said valve body between open flow and closed flow positions, with said valve body bore and said flow opening substantially aligning in said open flow position;
c. a pair of spaced generally parallel cylindrical drive chambers in said valve body, said flow conveying bore being generally between and parallel to said pair of spaced drive chambers;
d. a pair of powered cylindrical operator shafts, each movably mounted respectively within one of said pair of drive chambers, each of said shafts being smaller in diameter than said chambers;
e. drive piston means mounted on each end portion of said operator shafts for sealably engaging said chambers at the end portions of said shafts;
f. a pair of gear structures associated respectively with and engagedly driven respectively by said pair of operator shafts, each of said driven gear structures operating said gate valving member between said open flow and said closed flow positions responsive to their own powered movement within said drive chambers; and
g. attachment means for attachment of a hydraulic power source to at least one end portion of each of said pair of drive chambers, said attachment means hydraulically communicating with said drive chambers to move said piston means and said attached operator shafts.

4,392,632

ELECTROMAGNETIC VALVE WITH A PLUG MEMBER COMPRISING A PERMANENT MAGNET

Theodor Gast, Berlin, and Kurt Binder, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 279,822
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026133
Int. Cl.³ F16K 31/08
U.S. Cl. 251—65 9 Claims



1. An electromagnetic valve capable of being put into either of two positions by a pulse of current and requiring no flow of current to maintain it in either of said positions, comprising:

first and second cup cores (1,2) each having a reentrant axial pole portion, said cores being mounted facing each other co-axially with their rims joining each other to enclose a cavity, said re-entrant pole portions respectively having inner end faces facing each other across said cavity, said second cup core (2) having an axial bore passing through the re-entrant pole portion of said second cup core and extending to the exterior and having a valve seat provided with a seat surface in the shape of a surface of revolution coaxial with said cores and located in the internal orifice of said bore adjacent to said cavity; said cavity having at least one duct connection (9,10) to the exterior in addition to said bore;

a valve plug constituted by a body comprising a permanent magnet and having a closure surface facing said valve seat permitting engagement therewith and disengagement therefrom by axial movement of said plug, said plug being contained in said cavity in a manner permitting movement over a limited path in the axial direction of said cavity, at one end of which path said plug abuts said valve seat and closes said orifice of said bore, said magnet being magnetized in said axial direction;

first and second windings (3,4) respectively located in said first and second cup cores (1,2), surrounding the respective re-entrant pole portions of said cores and electrically connected together in circuit so that energization of said circuit with current flow in either direction will produce like magnetic poles at said end faces of the respective re-entrant pole portions of said cores;

means for applying a pulse of current, selectively in either direction, by said circuit, to said windings (3,4), and

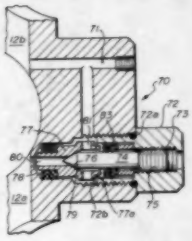
a ferromagnetic ring (5) having its periphery in contact with the rim portion of at least one of said cup cores (1,2) and extending inwards across said cavity, at a location axially intermediate of said end faces of said re-entrant pole portions of said cores, to such an extent as to provide an inner aperture of said ring, of which the inner surface is closely adjacent to the periphery of said plug, for completing a magnetic circuit path for said permanent magnet of said plug when said plug is at either end of its axial path of movement in said cavity and for at least assisting in constraining said plug to move only axially in said cavity.

4,392,633

VALVE STRUCTURE HAVING MOVABLE SEAT MEANS

Denzal W. Van Winkle, 411 Yorkchester, Houston, Tex. 77079

Filed Oct. 29, 1979, Ser. No. 89,180
Int. Cl.³ F16K 25/00, 31/12
U.S. Cl. 251—122 13 Claims



1. In a needle valve having a body with fluid passage means therein, the invention comprising:

a. a valve stem rotatably and sealably carried by the body and having a tapered, annular closure surface thereon;

b. longitudinally movable seat means in the body passage means for receiving said closure surface to close off the passage means, said seat means rotatable by said valve stem when said closure surface engages said seat means during opening and closing of the valve to reduce wear and galling between the seat means and the closure surface;

c. seal means sealing between said seat means and passage means; and

d. said seal means responsive to fluid pressure in the body passage means to urge said seat means longitudinally in the passage means toward said closure surface to form a tighter seal in response to pressure in the passage means in the body.

4,392,634

ELECTROMAGNETIC VALVE

Toshio Kita, Osaka, Japan, assignor to Fujikin International, Inc., Osaka, Japan

Filed Feb. 4, 1981, Ser. No. 231,320
Claims priority, application Japan, Feb. 4, 1980, 55-12829
Int. Cl.³ F16K 31/06; H01F 7/12
U.S. Cl. 251—129 3 Claims

1. An electromagnetic valve comprising:

a valve case having a fluid inlet, a fluid outlet and a channel holding the inlet in communication with the outlet, the channel being provided with a valve seat,

a valve stem having a closing member for blocking the channel by contact with the valve seat,

a movable core supporting the valve stem movably to bring the closing member into or out of contact with the valve seat,

a spring biasing the valve stem in a direction to bring the closing member into contact with the valve seat,

a support comprising a hollow cylindrical portion and an attaching portion fixed to the valve case for supporting the movable core movably,

a stationary core aligned with the movable core,

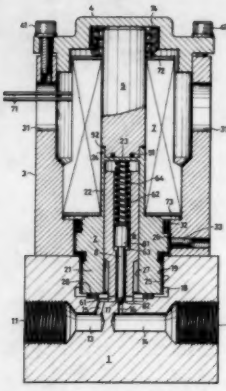
an exciting coil surrounding the movable core and the stationary core, and

a shading coil provided on an end surface of the stationary core which surface is opposed to the movable core,

the stationary core having a small diameter at the end thereof provided with the shading coil,

the cylindrical portion of the support extending toward the stationary core,

the cylindrical portion being integrally formed with a disk portion in contact with the end surface of the stationary



core and a projecting edge covering the periphery of the small-diameter end of the stationary core,

the small-diameter end fitting in the projecting edge with the forward end of the projecting edge welded to the stationary core.

4,392,635

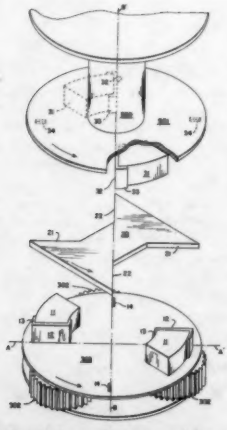
ROTARY POWER COUPLING AND PLANETARY GEAR WINCH

Dan C. Muessel, Danvers, and Nubar Hagopian, Boston, both of Mass., assignors to Rule Industries, Inc., Gloucester, Mass.

Filed Oct. 16, 1980, Ser. No. 197,654

Int. Cl.³ B66D *1/22*; F16D *3/04*

U.S. Cl. 254—344 **20 Claims**



1. A rotary mechanical coupling comprising:

a rotatable driving member adapted for connection to a sources of rotary mechanical power, said member being rotatable on a plane substantially normal to the axis of rotation of said source and comprising a pair of flat, radial driving surfaces lying on a diameter of said axis of rotation;

a rotatable driven member adapted for connection to a rotary power user, said driven member being spaced substantially coaxially from and substantially parallel to said driving member and comprising a pair of flat radial driven surfaces lying on a diameter of the axis of rotation thereof, said diameter being displaced by about 90° from the diameter defined by said driving surfaces of said driving member;

a coupling plate interposed between said driving and driven members, said coupling plate comprising a pair each of flat driven and driving surfaces corresponding to and in torque-transmitting, flush bearing contact with each of said pairs of flat radial driving and driven surfaces, respectively of said rotatable driving and driven members;

one or the other of the pair of flat radial driving surfaces of the driving member or the corresponding pair of flat driven surfaces of said coupling plate and one or the other of the pair of flat radial driven surfaces of said driven member or the corresponding pair of flat driving surfaces of said coupling plate each extending centrally at least somewhat beyond the bearing surface in flush contact therewith, thereby to allow sliding eccentric displacement of the coupling plate relative to the axes of rotation of said driving and driven members.

11. A planetary gear winch comprising

a prime mover,

a planetary gear train having at least one planetary gear speed reduction stage, said prime mover being coaxially connected to the rotary power input of said gear train,

a winch drum, and

a rotary mechanical coupling between said gear train and said winch drum, said coupling comprising:

a rotatable driving member connected to the rotary power output of said gear train, said member being rotatable on a plane substantially normal to the axis of rotation of said output and comprising a pair of flat, radial driving surfaces lying on a diameter of said axis of rotation;

a rotatable driven member connected to said winch drum, said driven member being spaced substantially coaxially from and substantially parallel to said driving member and comprising a pair of flat radial driven surfaces lying on a diameter of the axis of rotation thereof, said diameter being displaced by about 90° from the diameter defined by said driving surfaces of said driving member;

a coupling plate interposed between said driving and driven members, said coupling plate comprising a pair each of flat driven and driving surfaces corresponding to and in torque-transmitting, flush bearing contact with each of said pairs of flat radial driving and driven surfaces, respectively, of said rotatable driving and driven members;

one or the other of the pair of flat radial driving surfaces of the driving member or the corresponding pair of flat driven surfaces of said coupling plate and one or the other of the pair of flat radial driven surfaces of said driven member or the corresponding pair of flat driving surfaces of said coupling plate each extending centrally at least somewhat beyond the bearing surface in flush contact therewith, thereby to allow sliding eccentric displacement of the coupling plate relative to the axis of rotation of said driving and driven members and to thereby accommodate eccentric displacement of the axis of rotation of said winch drum relative to that of said rotary power output.

4,392,636

APPARATUS FOR DEGASSING MOLTEN METAL

Joseph A. Clumpner, St. Louis, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 22, 1981, Ser. No. 285,759

Int. Cl.³ C21C *5/48*

U.S. Cl. 266—218 **11 Claims**

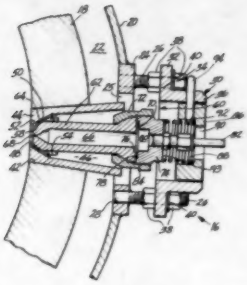
1. An apparatus for use in the degassing of molten metal which comprises:

a chamber having an inner elongated sidewall portion, an outer elongated sidewall portion and a central axis;

metal inlet means positioned at a first height and tangentially located with respect to said chamber for tangentially

introducing molten metal into said chamber such that said molten metal swirlingly flows from said molten metal inlet down through said chamber;

metal outlet means positioned at a second height below said first height for removing molten metal from said chamber; and



at least two fluxing gas inlet means mounted in said first inner elongated sidewall portion below said first height at different radial distances from said central axis of said chamber for introducing fluxing gas into said chamber.

4,392,637

METALLURGICAL MELTING APPARATUS WITH A BLOW-NOZZLE OR BURNER CAPABLE OF SWIVELLING IN DIFFERENT DIRECTIONS

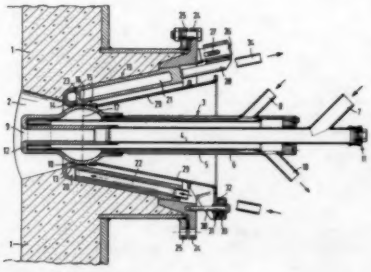
Ralph Weber, Sao Paulo, Brazil; Bernt Rollinger; Michael Nagl, both of Baden-Baden, Fed. Rep. of Germany, and Bernhard Rinner, Kehl am Rhein, Fed. Rep. of Germany, assignors to Korf-Stahl AG, Fed. Rep. of Germany and Voest-Alpine AG, Austria

Filed Sep. 10, 1981, Ser. No. 300,903

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034520

Int. Cl.³ C21B 7/16

U.S. Cl. 266—265 **12 Claims**



1. A metallurgical melting apparatus, in which sponge iron is melted to form liquid pig iron and reduction gas is produced from feed coal and oxygen-bearing gas, comprising a blow-nozzle mounted in the side-wall of said apparatus above the level of the melt capable of swivelling in different directions and having at least one tube, a nozzle-head (**12**) attached to said tube (**6**), having a spherical surfaced calotte (**13**) a forward ring-seat (**14**) anchored to the side-wall (**1**) of the melting apparatus sealingly contacting a forward surface of the calotte (**13**), and a rear ring-seat (**15**) contacting a rear surface of the calotte (**13**) which thrusts the callotte forward towards the forward ring-seat (**14**).

4,392,638

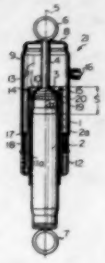
VEHICLE SUSPENSION DEVICE

Tetsuo Kato, Yokohama, Japan, and Naoki Makita, Southfield, Mich., assignors to Tokico Ltd., Kanagawa, Japan

Filed Apr. 9, 1981, Ser. No. 252,601

Int. Cl.³ F16F 9/08

U.S. Cl. 267—64.24 **7 Claims**



1. A vehicle suspension device comprising:

a hydraulic damper including a cylinder and a piston rod extending outwardly of one end of said cylinder;

a cylindrical housing mounted on said one end of said cylinder and surrounding a part of the outer circumference of said cylinder;

a cylindrical support member having a closed end attached to the extending end of said piston rod;

a flexible tubular wall member having a first end connected to said support member and a second end connected to said housing, said wall member, said housing and said support member defining an air chamber; and

means for enabling said housing to rotate relative to said cylinder about a longitudinal axis of said damper, and thereby for preventing twisting of said wall member, said means comprising a bearing supporting said housing on said cylinder.

4,392,639

DAMPER SUPPORT FOR ENGINE MOUNTS

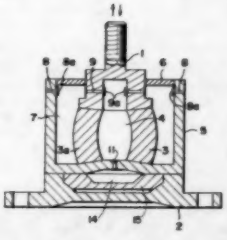
Keizo Konishi, Isuyama, Japan, assignor to Tokai Rubber Industries Ltd., Komaki, Japan

Filed Apr. 3, 1981, Ser. No. 250,902

Claims priority, application Japan, Apr. 11, 1980, 55-47553

Int. Cl.³ F16F 9/04

U.S. Cl. 267—140.1 **10 Claims**



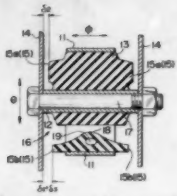
1. A damper support comprising: at least one confined chamber and a pump chamber defined by two mounting fixtures and by an elastic member hermetically connecting said two mounting fixtures, said pump chamber being operative to effect a pumping action in response to the vibrations of at least one of said mounting fixtures; means for providing communications between said pump chamber and the atmosphere and between said pump chamber and said confined chamber, respectively;

and check valve means mounted in said communication means, respectively.

4,392,640
VIBRATION ABSORBER FOR AN AUTOMOTIVE VEHICLE

Toshihiko Kakimoto, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 13, 1981, Ser. No. 253,570
Claims priority, application Japan, Apr. 21, 1980, 55-52664
Int. Cl.³ F16F 1/38
U.S. Cl. 267—141.2 **4 Claims**



1. A vibration absorber adapted to be disposed between the body and the power unit of an automotive vehicle, comprising:

(a) a spool-shaped body having an inner cylinder with a pair of axially spaced plate members fixedly joined thereto;

(b) an outer cylinder having a diameter larger than that of said inner cylinder and being disposed concentrically with said inner cylinder; and

(c) a rubber member, having: (i) a tubular portion which is fixed to the interior of said outer cylinder, (ii) an arm which is fixed to said inner cylinder and which extends radially therefrom in opposite directions to said tubular portion, said arm having radially intermediate portions with axial dimensions greater than that of the remainder of the arm but less than the axial spacing between said plate members, said arm being further provided with a pair of radially outer portions having axial dimensions less than that of the remaining portions of the arm; and (iii) a pair of diametrically opposed projections extending inwardly from the tubular portion in a direction substantially perpendicular to the radial disposition of said arm with the inner ends of said projections being spaced from said arm, said rubber member being adapted to deform in a way such that when said spool-shaped body vibrates radially in directions transverse to that of said arm, said arm is deformed in a shear mode prior to contacting said projections and said projections are deformed in a compression mode when contacted by said arm, and when said spool-shaped body vibrates in the axial direction, said arm is deformed in a shear mode prior to contacting said plate members, and in a compression mode when said radially intermediate portions contact said plate members;

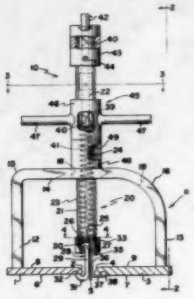
whereby multistep elasticity characteristics can be obtained in both the radial and axial vibration directions of said spool-shaped body.

4,392,641
ALIGNMENT TOOL

Timothy C. Dearman, P.O. Box 937, Pearland, Tex. 77581

Filed Sep. 17, 1981, Ser. No. 302,970
Int. Cl.³ B25B 5/14
U.S. Cl. 269—49 **7 Claims**

1. A welding tool for use in positioning in predetermined locations spaced apart, confronting edges of two members to be welded together, said tool comprising a body having two legs adapted to straddle the space between said edges and a bridge joining said legs, said bridge having an opening therein extending from adjacent the middle of said bridge toward one of said legs and said opening terminating closer to said one leg than to the other of said legs; a drawbar slidably extending through said opening, said drawbar terminating at one end in a laterally extending foot of such width as to pass through the space between said edges and of such length as to engage a surface of a single one of said members adjacent such space, said opening in said bridge having a length greater than the

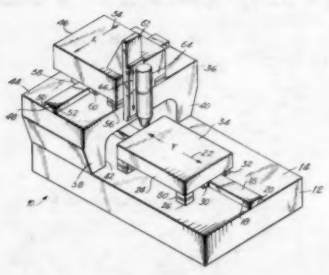


thickness of said drawbar; and means carried by said drawbar for moving said drawbar relatively to said body in a direction to enable said foot to engage such surface of said one of said members and displace such member relatively to the other of said members in the direction of said bridge.

4,392,642
WORKPIECE POSITIONING TABLE WITH AIR BEARING PADS

Anwar Chitayat, Plainview, N.Y., assignor to Anorad Corporation, Hauppauge, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,930
Int. Cl.³ B23Q 1/02
U.S. Cl. 269—73 **4 Claims**



1. A workpiece positioning table of the type having at least one table and at least one plurality of spaced apart air bearing pads for supporting said at least one table above a horizontal surface, comprising:

a source of pressurized air;

an air pressure regulator operative to receive said pressurized air and to regulate its output air pressure to a substantially constant air pressure;

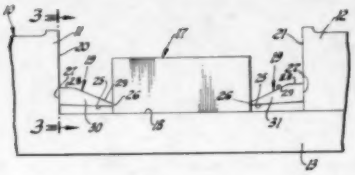
a plurality of flow control valves each of which receives said substantially constant air pressure and feeds air pressure to one of said at least one plurality of air bearing pads; and

means for independently adjusting a constant flow of air through each of said flow control valves in said plurality of flow control valves to independently control a height of a lift above said horizontal surface developed by each of said air bearing pads.

4,392,643
MAGNETIC HOLD DOWN TOOL

Gary P. Campeau, Southfield Township, Oakland County, Mich., assignor to Suburban Tool, Inc., Birmingham, Mich.

Filed Mar. 27, 1980, Ser. No. 134,541
Int. Cl.³ B23Q 3/02
U.S. Cl. 269—136 5 Claims



1. The combination with a vise having a pair of jaws, of a pair of workpiece hold down tools, characterized in that:

(a) each of said hold down tools includes an elongated body having a front end surface for engagement with a workpiece, a flat bottom surface perpendicular to the front end surface, and a rear end surface for mounting against the clamping face of a vise jaw;

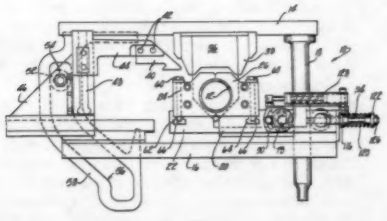
(b) the rear end surface of each body is formed on a plane that is non-parallel with the body front end surface by an inwardly directed acute angle; and,

(c) magnet means is fixedly mounted on the rear end surface of each body for releasably retaining each hold down tool on the clamping face of one of the pair of vise jaws in a self retaining manner at a selective level relative to a workpiece to be held between the pair of vise jaws, whereby when the vise jaws are moved to a position to clamp said workpiece the front ends of the hold down tools engage said workpiece with a line contact and exert a downward holding pressure on said workpiece.

4,392,644
TUBE CUTTING APPARATUS

John J. Borzym, 4820 Schoolbell La., Birmingham, Mich. 48010

Continuation of Ser. No. 119,241, Feb. 7, 1980, Pat. No. 4,294,147. This application Jun. 4, 1981, Ser. No. 270,298
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.³ B23D 21/00, 25/04
U.S. Cl. 269—157 8 Claims



1. Apparatus for clamping a workpiece comprising:

a pair of opposed jaws for engaging the workpiece;

first and second means for mounting said jaws for reciprocating movement toward and away from each other between an open release position and a closed clamping position;

first and second spaced apart cam follower means respectively coupled with said first and second mounting means;

cam means for displacing said cam follower means;

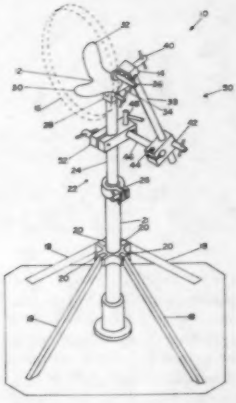
means for selectively adjusting the distance between said jaws when the latter are in said closed clamping position thereof, including means for mounting one of said first and second cam follower means for movement toward and away from the other of said first and second cam follower means, and

means for limiting the magnitude of force transferred from said cam means through at least one of said first and second cam follower means to said jaws to a predetermined level thereof, regardless of the distance between said jaws.

4,392,645
HEAD SUPPORT AND HALO JIG

Thomas R. Westphal, 143B E. Frederick St., Lancaster, Pa. 17602

Filed May 28, 1981, Ser. No. 268,007
Int. Cl.³ A61G 13/00
U.S. Cl. 269—328 2 Claims



1. A head support and halo locating jig for use in attaching a halo band to the head of a patient positioned with neck and head extending off the end of a patient support means, comprising:

a base means resting on the floor below the patient's neck and head;

a pillar means movably attached and clamped to the base means and extending vertically upward to the region just below the patient's head;

a head support cradle pivotably attached to permit movement in only a single vertical plane and clamped to the top of the pillar means; and

a halo locating system adjustably clamped to the pillar independent of the head support cradle attachment means, including at least two clamped swivel adjustments independent of the head support cradle adjustment, and holding the halo band in a stable, predetermined position relative to the head support means.

4,392,646
SPREADING MACHINE CUTTER BOX AND CLAMP ASSEMBLY

Conrad A. Costigan, Richmond Hill, N.Y., assignor to Spreading Machine Exchange, Inc., New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,822
Int. Cl.³ B65H 29/46
U.S. Cl. 270—30 10 Claims

1. A sheet material spreading machine comprising a carriage mounted for movement along a table surface and carrying a supply of sheet material to be deposited in superimposed layers on said table surface, with each layer of sheet material depos-

ited in an operative run of said carriage in opposite directions along said table surface,

a cutter box and clamp assembly carried by said carriage and adapted to cut off the layer of sheet material deposited on the table surface at one end of each operative run of said carriage, said cutter box and clamp assembly comprising:

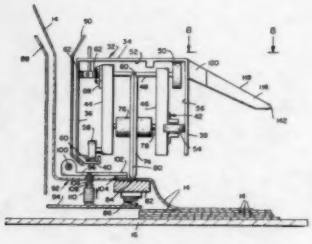
an elongated support member mounted on said machine carriage and extending transversely thereof,

a cutter frame movably mounted on said support member,

guide means on said support member for guiding movement of said cutter frame in opposite directions along said support member,

drive means on said support member for moving said cutter frame along said guide means,

a circular cutter member rotatably mounted for free rotation on said cutter frame in a vertical position and having an edge portion,



a pressure bar mounted on said support member in a horizontally-disposed position and having a solid impermeable planar surface underlying said cutter member wherein the sheet material passes between said cutter member and said planar surface and is pressed into engagement with said planar surface by said edge portion along a cutting line,

biasing means mounted on said support member and adapted to urge said pressure bar into firm engagement with said cutter member, said cutter member rotating at a speed such that said edge portion moves in a substantially non-slipping relationship with the sheet material to thereby cause said cutter member to score the sheet material fed between said cutter member and said pressure bar under rolling action of said cutter member against said pressure bar as said cutter member is carried by said cutter frame along said support member, and

clamp means disposed to clamp said sheet material to said pressure bar, adjacent to the path of travel of said cutter member.

4,392,647

FLOOR HOCKEY CAROM CORNER

William J. Golebieski, 300 Stoneybrooke Dr., Cheswick, Pa. 15024

Filed Jan. 20, 1982, Ser. No. 340,867
Int. Cl.³ A63B 71/02
U.S. Cl. 272—3 **6 Claims**

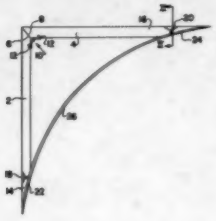
1. A carom corner for an indoor floor game, said corner comprising, in combination

first and second frame members, each of said frame members having a chamfered end whereby said frame members may be joined to form a right angle,

hinge means joining said frame members,

said frame members further having in the vicinity of their ends remote from said hinge arcuately shaped recessed portions,

a panel member of flexible material and arcuate shape, and



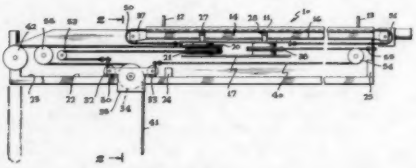
means securing the ends of said panel to said remote ends of said frame members.

4,392,648

THEATRICAL TRANSPORTATION APPARATUS

Peter S. Foy, 4345 Topaz St., Las Vegas, Nev. 89121

Filed May 26, 1981, Ser. No. 266,925
Int. Cl.³ A63J 5/12
U.S. Cl. 272—24 **6 Claims**



1. A theatrical personnel transportation apparatus for positioning a performer in a vertical viewing plane having a portion thereof exposed to a viewing audience comprising:

an elongated stationary monorail lying in the vertical viewing plane out of view of the audience;

said monorail having an upper track and a lower track extending between the opposite ends of said monorail;

a first movable carriage carried on said upper track and a second movable carriage carried on said lower track whereby both of said carriages being adapted to move between the opposite ends of said tracks respectively;

a first pulley system having a plurality of pulley wheels and a line trained over said wheels wherein the opposite ends of said line are connected to the respective opposite ends of said carriage so that said carriage may be selectively moved along said upper track;

a second pulley system having a first pair of pulley wheels carried on said first carriage and a line trained over said pair of pulley wheels having its opposite ends fixly secured to said monorail whereby said second carriage moves in a direction opposite to the direction of movement of said first carriage and at twice the speed; and

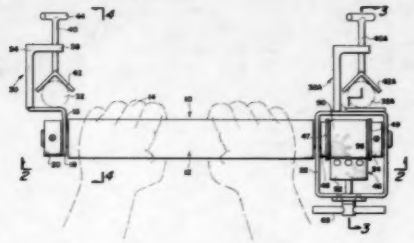
a third pulley system having a second pair of pulley wheels disposed so that one pulley wheel is mounted on said first carriage and the other pulley wheel of the pair is mounted on said second carriage and a line trained over said second pair of pulley wheels wherein the opposite ends of said line are connected to a wind-up drum and to the performer respectively whereby the performer is supported in mid-air from said monorail so that the performer may be maneuvered vertically and laterally within the vertical viewing plane exposed to the audience in response to movement of said first and second carriages respectively.

4,392,649

HAND, WRIST AND FOREARM EXERCISING DEVICE

Dan Chapman, 1107 E. Teresa, Sapulpa, Okla. 74066

Filed Jun. 22, 1981, Ser. No. 276,030
Int. Cl.³ A63B 21/00
U.S. Cl. 272—67 3 Claims



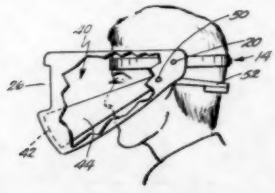
1. A hand, wrist and forearm exercising apparatus adapted to be removably mounted on a support structure and comprising elongated continuous roller means to be grasped about the outer periphery by the hands of the user for twisting thereof about its own longitudinal axis, clamping means secured to the opposite ends of the roller means for suspending the roller means therebetween and securing said roller means to said support structure, and tensioning means operably connected with the roller means and disposed in the proximity of one end thereof, said tensioning means comprising a sleeve means secured in the proximity of one end of the roller means, friction belt means disposed around at least a portion of the outer periphery of the sleeve means, and means operably connected directly to the friction belt means for adjusting the tension of the belt for providing substantially any desired resistance to the twisting motion for an effective exercising of the hands, and wrist and forearm of the user.

4,392,650

TENNIS TRAINING AID

Carl W. Hilton, Muskegon, Mich., assignor to Return on Investment Corporation, Muskegon, Mich.

Filed Mar. 3, 1981, Ser. No. 240,168
Int. Cl.³ A63B 61/00
U.S. Cl. 273—29 A 14 Claims



1. A training aid primarily adapted for use in training a tennis player to properly orientate the head and to concentrate on the tennis ball, said aid comprising:

a hood having a pair of spaced side panels defining an aperture through which the user must view;

a band secured to said hood, said band adapted to support the hood on the head of the user and in a position so that the user must look through said aperture, said hood dimensioned to limit the peripheral vision of the user; and

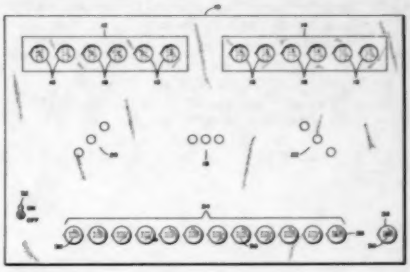
indicator means secured to said hood adjacent said aperture for visually indicating when the user moves his head and eyes from a normal horizontal position relative to a playing surface by moving into and at least partially blocking said aperture of said hood.

4,392,651

ELECTRONIC LOGIC GAME

Alfred E. Hall, Dallas, Tex., assignor to Sigalos & Levine, P.C., Dallas, Tex.

Division of Ser. No. 190,612, Sep. 25, 1980, Pat. No. 4,350,340.
This application Jul. 6, 1982, Ser. No. 395,133
Int. Cl.³ A63F 9/06
U.S. Cl. 273—153 R 8 Claims



1. An electronic logic game comprising:

a. a simulated electronic balance scale,

b. a plurality of units to be symbolically weighed, one of which units differs from the others electronically by including a first magnet to represent said unit being lighter than the other units or first and second magnets to represent said unit being heavier than the other units and selected ones of which units may be symbolically positioned on said simulated balance scale,

c. means associated with said simulated balance scale for detecting said different unit when symbolically positioned on said simulated balance scale, and

d. circuit means coupled to said detecting means for representing said scale to be balanced or unbalanced in a predetermined direction according to said state of said different unit whereby said different unit may be logically discovered in a predetermined number of said electronic scale balance or unbalance representations.

4,392,652

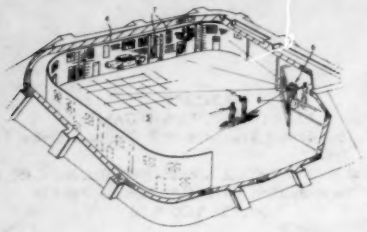
TARGET COMPRISING A RESILIENT MATERIAL COATED WITH THERMOLUMINESCENT MATERIAL

Lindsay C. Knight, Albury, Australia, and Robert A. Cottis, Stockport, England, assignors to Australasian Training Aids Pty. Ltd., Albury, Australia

Continuation of Ser. No. 43,486, May 29, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 187,819
Claims priority, application United Kingdom, May 26, 1978, 23483/78
Int. Cl.³ F41J 5/00, 9/14
U.S. Cl. 273—358 4 Claims

1. A target comprising a support member adapted to be penetrated by projectiles, said support member being formed from a resilient material which is not destroyed when a projectile passes therethrough and which locally increases in temper-

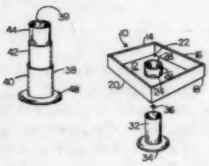
ature as it is penetrated by said projectile, a coating of thermoluminescent material on said support member which is operable to luminesce in the area adjacent the position at which the projectile passes through the target.



4,392,653
GAME APPARATUS

James W. Blume, Sr., 1851 Glatt, Arnold, Mo. 63010

Filed Oct. 30, 1981, Ser. No. 316,752
Int. Cl.³ A63B 63/04, 63/08
U.S. Cl. 273—400 13 Claims



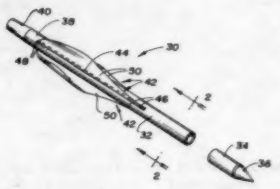
10. A method of playing a game comprising providing a base member having side walls extending upwardly therefrom around the perimeter thereof, an opening positioned near the center of said base member spaced from said side walls, providing a tubular member extending upwardly from said base member and having a central cavity that registers with said opening forming a target, providing a receiving member insertable through said tubular member for increasing the height of the target, said receiving member having a central cavity for receiving playing pieces tossed therein, providing a plurality of playing pieces of a size to be thrown into the central cavity of said receiving member, tossing a predetermined number of said playing pieces from a predetermined distance from the base member toward the target with the intention of having them enter the center cavity of said receiving member, and scoring the value of selected ones of playing pieces tossed based upon the position of said playing pieces when they come to rest relative to said target.

12. A game apparatus for playing a toss type skill game, said apparatus forming a target area for the game and comprising an open topped container defined by a bottom wall and a peripheral wall extending upwardly from around the bottom wall, a hole through the bottom wall at a location spaced from the peripheral wall, a first tubular member positioned extending upwardly from the bottom wall through said hole, said first tubular member having an open upper side forming a target for receiving objects thrown at the apparatus, said first tubular member having an outer cross sectional size and shape to match the shape of the hole through the bottom wall whereby said tubular member can be moved through the hole in the bottom wall of said container, means on said first tubular member adjacent one end thereof movable into engagement with the bottom wall of said container to limit movement thereof through said hole, and a second tubular member positioned for movement through said first tubular member and along the entire length thereof, the length of said second tubular member being greater than the length of said first tubular member.

4,392,654
ARROW FLETCHING

Richard F. Carella, 35572 Strathcona, Mount Clemens, Mich. 48043

Filed Jun. 19, 1981, Ser. No. 275,167
Int. Cl.³ F41B 5/02
U.S. Cl. 273—423 15 Claims

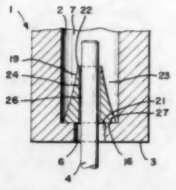


11. An arrow including a shaft having front and rear ends and a plurality of fletchings mounted on the rear end spaced circumferentially about the shaft from each other, each fletching being of a unitary plastic construction comprising: a foot mounted on the rear end of the arrow shaft and having front and rear ends; a flexible vane that projects radially from the foot; the vane having a front end that projects radially throughout the extent thereof; and the vane having a rear end including an inner portion that projects radially from the foot and an outer portion having a continuously curved shape over a major portion of the radially projecting height thereof from the foot, said curved shape of the vane being inclined inwardly toward the foot in a rearward direction to define a pocket for restricting air flow such that the vane flexes to moderate drag in response to wind changes.

4,392,655
HIGH-PRESSURE SEAL WITH CONTROLLED DEFLECTION UNDER PRESSURE

John H. Olsen, Vashon, and Robert S. Pritchard, Seattle, both of Wash., assignors to Flow Industries, Inc., So. Kent, Wash.

Filed Sep. 19, 1980, Ser. No. 188,980
Int. Cl.³ F16J 15/48, 15/40
U.S. Cl. 277—1 21 Claims

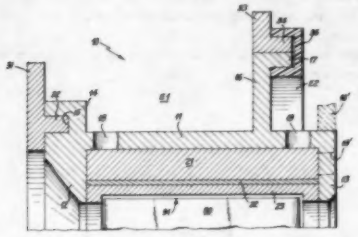


1. A seal for a shaft extending between high pressure and low pressure regions, comprising: a seal body for surrounding said shaft with a gap of predetermined configuration between said seal body and said shaft under non-pressurized conditions and extending from said high pressure region to said low pressure region, the exterior of said seal body being subjected to the fluid pressure within said high pressure region acting radially thereon; and means for controlling the radial compressive deformation of said seal body along the length thereof to provide a predetermined clearance between said seal body and said shaft under pressurized conditions to control leakage of said high-pressure fluid.

4,392,656
AIR-COOLED SEALING RINGS FOR THE WHEELS OF GAS TURBINES

Jacques P. H. Tirole, Sevres; Claude M. Mons, Savigny Le Temple, and Roland R. Spinat, Bretigny sur Orge, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Oct. 23, 1980, Ser. No. 200,036
Claims priority, application France, Oct. 26, 1979, 79 26666
Int. Cl.³ F01D 11/08; F02F 11/00
U.S. Cl. 277—53 7 Claims



1. An assembly including a cooled sealing ring for the bladed wheel of a gas turbine of the type comprising successively from the periphery toward the axis:

an annular support surrounding the wheel,

a first annular layer designated the "cooling layer" attached to the inner surface of said annular support and made of a material permeable to air,

cooling air inlet means at the upstream region of said cooling layer, downstream exhaust means and deflectors in said cooling layer, said cooling layer being of a material whereby it serves as a reserve wear layer;

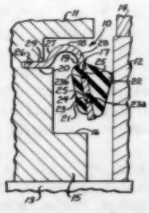
a thin, separating layer radially inwardly of said cooling layer, said separating layer being permeable to air with its permeability decreasing from upstream to downstream; and

a wear layer adjacent the ends of the wheel blades and made of a material capable of being abraded by said blades and being traversed radially by the air from the cooling layer passing through the separating layer.

4,392,657
BELLEVILLE SPRING LOADED SEAL

Robert D. Roley, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00164, § 371 Date Feb. 19, 1980, § 102(e) Date Feb. 19, 1980, PCT Pub. No. WO81/02455, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 19, 1980, Ser. No. 151,841
Int. Cl.³ F16J 15/32, 15/34
U.S. Cl. 277—95 16 Claims



1. In a joint having a first member (11,111) and a second member (12) variably spaced adjacent said first member, an improved sealing structure (10,110) for sealing said first member to said second member across the movable space therebetween, said sealing structure comprising:

a frustoconical Belleville spring (17,117);

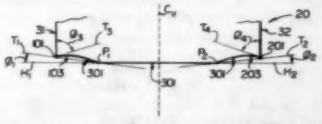
an annular support spring (18,118) defining an arcuate cross section having an end (19,119) connected to an outer portion of the Belleville spring and an opposite end (20,120) sealingly mounted to said first member (11,111), the spring constants of said Belleville (17,117) and support springs (18,118) being preselected to cumulatively cause a biasing sealing force developed thereby to continuously increase with an increase in deflection of said springs over the range of variable spacing between said members (11,111,12) notwithstanding a decrease in the sealing force developed by the Belleville spring alone over a portion of the range of increasing deflection; and

a seal element (21,121) fixed to said Belleville spring and having a lip portion (22,122) urged into dynamic sealing engagement with said second member (12) by said cumulative continuously increasing biasing action of said spring.

4,392,658
SKATE BLADE

Harry W. Redmond, and Raymond V. Jeannotte, both of Langley, Canada, assignors to Norjay Services, Ltd., Langley, Canada

Filed Dec. 5, 1980, Ser. No. 213,228
Int. Cl.³ A63C 1/30
U.S. Cl. 280—11.18 34 Claims



1. An elongated skate blade for an ice skate, said blade comprising:

(a) a first acute-angled cutting edge formed longitudinally on one side of said blade for providing cutting engagement with an ice surface;

(b) a second acute-angled cutting edge formed longitudinally on the opposite side of said blade for providing cutting engagement with the ice surface; and,

(c) a generally downwardly facing longitudinally extending bottom surface extending transversely from said first cutting edge to said second cutting edge, said bottom surface including:

(i) a first longitudinally extending edge face rising upwardly and inwardly from said first cutting edge;

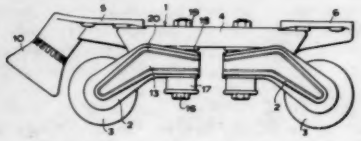
(ii) a second longitudinally extending edge face rising upwardly and inwardly from said second cutting edge; and,

(iii) a longitudinally extending middle face centrally disposed between said first and second edge faces and merging substantially smoothly therewith, said middle face having a substantially flat profile in transverse cross-section for at least one-third of the distance from the transverse centre of the blade to each side of the blade.

4,392,659
TWO-WHEELED ROLLER SKATE

Koichi Yoshimoto, Kobe, Japan, assignor to Hanshin Sogyo Co., Ltd., Osaka, Japan

Filed Feb. 17, 1981, Ser. No. 234,895
Claims priority, application Japan, Nov. 25, 1980, 55-168513[U]
Int. Cl.³ A63C 17/06
U.S. Cl. 280—11.23 1 Claim

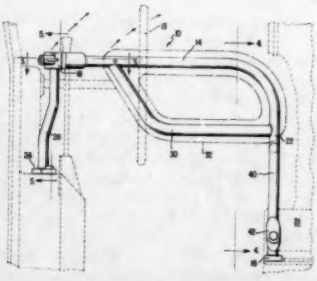


1. A two-wheeled roller skate comprising:
(a) a base plate having first and second vertical openings extending therethrough;
(b) a pair of suspension arms extending longitudinally of said base plate and generally parallel thereto;
(c) each of said suspension arms having a first end swingably connected to said base plate, a downwardly bent intermediate portion, and a second end, and having a skate roller connected to said second end:
(d) first bolt means extending through said first and second openings for swingably supporting said suspension arms;
(e) second bolt means extending horizontally through said bent portion of each suspension arm for pivotably supporting the suspension arms on said base plate;
(f) each of said first and second vertical openings in said base plate being larger at the bottom end thereof than at the top end thereof to accommodate pivoting movement of said suspension arms about said second bolt means; and
(g) a toe base portion at one end of said base plate and a heel base portion at the other end of said base plate, said toe base portion being connected to said base plate by said second bolt means, and said heel base portion being connected to said base plate by said second bolt means.

4,392,660
SAFETY BAR

James V. Mason, Rte. 1 Box 370, and Mancil C. Fisher, Rte. 1, both of Lake Toxaway, N.C. 28747

Filed Aug. 29, 1980, Ser. No. 182,505
Int. Cl.³ B60N 5/00; B60R 21/10
U.S. Cl. 280—751 8 Claims

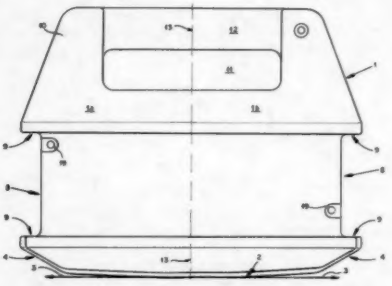


1. A safety device for preventing inadvertent passage through the entryway of a vehicle comprising:
a generally inverted L-shaped safety bar consisting of a horizontal means adapted to extend across said entryway, and a vertical means, said horizontal means being fixedly attached at one end thereof to an upper portion of said vertical means to provide an open area below said horizontal means;
means for mounting a lower end of said vertical means to said vehicle for pivotal movement of said safety bar transverse to said entryway;
said mounting means comprising vertically extending members having holes for cooperating with holes in said vertical means;
wherein said vertical means comprises two spaced vertical elements, each of said vertical elements being mounted to one of said vertically extending members for pivotal movement; and
means for latching said bar to retain it in a position across said entryway.

4,392,661
SUPPLY APPARATUS TO PROVIDE ELECTRICITY TO MOTOR-DRIVEN APPLIANCES, ESPECIALLY LAWN EDGE TRIMMERS, DRIVEN WITH ELECTRIC MOTORS

Max Langenstein, Mühlweg 1, 7928 Illertissen, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,732
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 7926920[U]
Int. Cl.³ B62B 15/00; H01M 2/10
U.S. Cl. 280—12 M 4 Claims



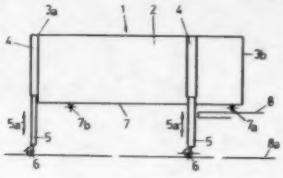
1. An electrical supply apparatus for hand-tools or the like, comprising:
an upright housing having a downwardly convex bottom elongated in one direction to form a runner extending in said direction, said housing being formed with a handle at its upper end, said housing having an outwardly open annular recess above said runner, said bottom having a greater curvature in a vertical median plane in said direction than transversely to said plane, said housing being formed with an opening in said plane and in said recess at a level not substantially above the center of gravity of the apparatus;
a battery in said housing;
a cable running to said battery extending out of said housing through said opening for connecting the apparatus to a hand-tool or the like, said cable being adapted to be coiled in said recess; and
cable-tension relief means connecting said cable to said housing.

4,392,662

DEVICE FOR FACILITATING PARTICULARLY THE LOADING AND UNLOADING OF CONTAINERS ETC. FROM VEHICLES ETC.

Norbert Höglinger, Via Stazione, 34, I-Caldaro (Bozen), Italy

Filed Jun. 25, 1981, Ser. No. 277,259
Claims priority, application Italy, Jul. 10, 1980, 4829 A/80
Int. Cl.³ B60P 1/64
U.S. Cl. 280—43.23 **1 Claim**



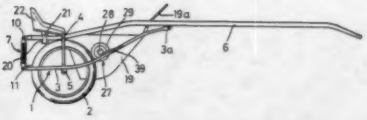
1. A container structure comprising, in combination: a bottom wall; an upstanding front wall; an upstanding rear wall; an opposed pair of upstanding side walls; a first pair of like telescopic leg assemblies vertically mounted upon the exterior surface of said rear wall in spaced parallel relationship with one another, each leg assembly being inwardly displaced from a corner-defining junction of a respective side wall and said rear wall by an amount substantially less than its spacing from the other leg assembly; a second pair of like telescopic leg assemblies, each of which is vertically mounted upon the exterior surface of a respective side wall and is rearwardly equidistant from said front wall by an amount leaving said container structure with a substantial cantilever portion terminating in said front wall; a first set of swivel casters mounted directly on said bottom wall forwardly of said first pair of telescopic leg assemblies and proximate thereto; a second set of swivel casters mounted directly on said bottom wall within the cantilever portion of said container structure; and a respective swivel caster mounted on the lower end of the leg of each telescopic leg assembly; the arrangement being such that, with the legs of the telescopic leg assemblies initially extended, one can roll said container structure along a horizontal base surface to position said cantilever portion over a stationary parallel elevated surface, then retract the legs of said second pair of telescopic leg assemblies to lower said cantilever portion and obtain rolling support thereof on said elevated surface by said second set of swivel casters, thereafter forwardly roll said container structure until said first set of swivel casters is positioned over said elevated surface, and finally retract the legs of said first pair of telescopic leg assemblies to obtain rolling support of the rear end of the container structure on said elevated surface by said first set of swivel casters, thereby to facilitate completion of the loading of the container structure onto said elevated surface.

4,392,663

TRAINING CART

Gösta Forslund, S-780 45 Björbo, Sweden

Filed Jun. 17, 1981, Ser. No. 274,671
Claims priority, application Sweden, Jun. 19, 1980, 8004594
Int. Cl.³ B62C 1/08
U.S. Cl. 280—68 **10 Claims**



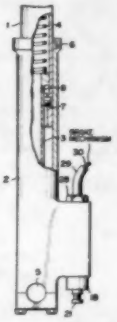
1. A two-wheeled cart for training trotters, wherein the cart frame comprises two longitudinal rigid thill members, which at a central part thereof are pivotally connected through a cross connecting member to be vertically rotatable in relation to each other, wherein each wheel is individually resiliently suspended at a rear part of the respective thill member, and wherein a seat supporting cart member is separately resiliently supported by the cart frame.

4,392,664

FRONT FORK OF MOTORCYCLE

Takayoshi Tsuchiya, and Masami Matsuo, both of Iwata, Japan, assignors to Showa Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,398
Claims priority, application Japan, Nov. 4, 1980, 55-153810
Int. Cl.³ B62K 25/08
U.S. Cl. 280—276 **8 Claims**



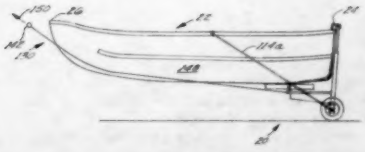
1. A front fork assembly for use on a motorcycle, comprising: a fork pipe; a bottom casing slidably fitting the lower portion of said fork pipe and having means for connection to the axle of the front motorcycle wheel, said bottom casing having its inside filled with oil; a seat pipe anchored at the bottom portion of said bottom casing and having its upper end slidably fitted in said fork pipe; a valve seat slidably fitted in an oil passage for providing communication between the inside and outside of said seat pipe and supported by a spring; a plunger having a valve disposed to face said valve seat for opening and closing said oil passage; and coaction means for effecting coaction between said plunger and a braking mechanism.

4,392,665

BOAT DOLLY

Toby D. Miller, 616 S. Lee St., Garrett, Ind. 46738, and James A. Miller, 204 E. Diamond, Kendallville, Ind. 46755

Filed Apr. 15, 1981, Ser. No. 254,434
Int. Cl.³ B60P 3/10
U.S. Cl. 280—414.2 **10 Claims**



1. A boat dolly having first and second ends comprising:
cradle frame means for receiving and supporting the stern portion of a boat,
a pair of transversely spaced-apart wheels operatively mounted to said cradle frame means;
flexible supporting and propelling means, comprising two

transversely spaced apart ropes secured at one end to said cradle frame means and extending longitudinally forwardly of the underside of the hull of a boat on said frame means for both supporting the bow portion of said boat and propelling said boat and said boat dolly as a unit in response to a pulling force exerted on the other end thereof,

said frame means having front and rear portions and including two spaced longitudinal frame members and two spaced cross frame members secured thereto, transversely spaced eyelets depending from said frame means and receiving said ropes therethrough thereby spacing said ropes apart,

an upright strut device hingedly mounted on the rear portion of said frame means for pivotal movement about a transverse axis between first and second positions, in said first position said strut device being upright and in said second position said strut device being folded onto said frame means,

said strut device including two elongated substantially parallel and spaced apart struts each being provided with a laterally extending elongated stub, a hinge bar hingedly mounted on the rear portion of said frame means for swinging movement about a transverse axis parallel to the axis of said hinge bar, said hinge bar being hollow and telescopically receiving said stubs within the opposite end portions thereof,

means for releaseably locking said stubs and hinge bar together in adjusted telescoped position; and

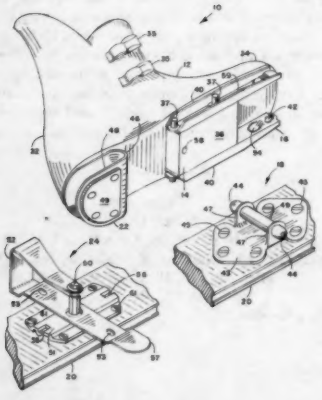
said wheels being carried on the lower ends of said struts, respectively.

4,392,666

INTEGRAL SKI BINDING

Paul C. Ramer, Golden, Colo., assignor to Alpine Research, Inc., Golden, Colo.

Filed Mar. 13, 1981, Ser. No. 243,424
Int. Cl.³ A63C *9/02*
U.S. Cl. 280—614 **9 Claims**



1. A boot-boot plate binding for releasably connecting a foot of a skier to a ski comprising in combination:

a toe piece mounted on said ski including retention means extending laterally of said ski;

a boot plate having a block portion and semirigid elongated member means extending longitudinally of said ski, said elongated member means having connection means on forward ends thereof for releasable and pivotable connection to said retention means;

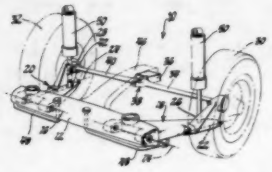
a boot being conformable to and adapted to retain the foot of said skier, said boot being fixedly connectable to said boot plate at selected locations for movement therewith whereby the boot and boot plate can pivot about a lateral axis of said ski.

4,392,667

VEHICLE SUSPENSION SYSTEM

Horacio Shakespear, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1980, Ser. No. 192,729
Int. Cl.³ B60G *3/00*
U.S. Cl. 280—690 **3 Claims**



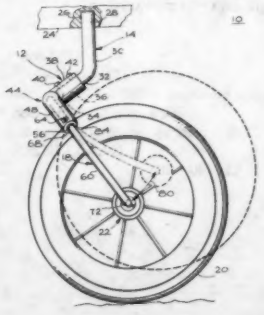
1. In an independent suspension system for a vehicle having a body member, a pair of laterally spaced road wheels, a pair of laterally spaced control arms disposed on said body member for independent pivotal movement in jounce and rebound directions from a central position about respective ones of a pair of pivot axes disposed in a transverse vertical plane of said body member, a pair of spindle support members each adapted to rotatably support a respective one of said road wheels, and hinge means connecting a first portion of each of said spindle support members to respective ones of said control arms for pivotal movement about generally longitudinal axes defined by said respective ones of said control arms so that each of said spindle support member first portions moves in a plane perpendicular to a corresponding one of said pivot axes during jounce and rebound deflections of corresponding ones of said road wheels, the improvement comprising, a pair of laterally extending control means disposed between said body member and respective ones of said spindle support members operative to constrain a second portion of each of said spindle support members spaced vertically above corresponding ones of said first portions to move laterally along an arc of finite radius during jounce and rebound deflections of said road wheels.

4,392,668

SHOCK-ABSORBING WHEEL SUSPENSION ASSEMBLY

Lawrence K. Mulholland, 416 Mara St., Ventura, Calif. 93004

Filed Dec. 9, 1980, Ser. No. 214,485
Int. Cl.³ B60G *11/18*
U.S. Cl. 280—721 **11 Claims**



1. An improved torsionally shock-absorbing wheel suspension assembly, said assembly comprising, in combination:

a. a rigid yoke having a generally upwardly extending neck and a pair of downwardly diverging hollow tubular sleeves connected to the lower end of said neck, both of said sleeves being directed either rearwardly or forwardly relative to said neck;

b. a pair of flexible torsion resilient lever support arms, the upper ends of which extend into said sleeves, the elongated middle portions of which are generally parallel to each other and extend downwardly and in the same rearward or forward direction as said sleeves relative to said neck and the lower ends of which arms are angled to approximate each other in an about horizontal plane; and

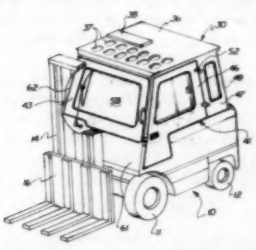
c. a wheel disposed between said lower ends with a central hub which receives and holds said lower ends of said arms in a fixed position relative to said hub, whereby upward deflection of said wheel exerts flexing and torquing of said flexible torsionally resilient arms to effect effective shock absorption by said assembly.

4,392,669

CAB FOR LIFT TRUCK WITH SWING OUT WINDSHIELD

Robert P. Martin, Jr., 12576 Lake Ave., Lakewood, Ohio 44107

Filed Oct. 24, 1980, Ser. No. 200,333
Int. Cl.³ B62D 1/18
U.S. Cl. 280—775 9 Claims



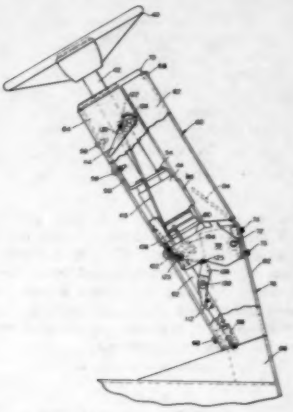
1. In combination a lift truck having a mast at its front end and a steering wheel disposed rearwardly of the mast and movably mounted for displacement along a path from a rearward operational position to a temporary forward clearance position, a cab having a structure for protecting a driver seated rearwardly of the operational position of the steering wheel, said cab structure including a forward face having a windshield, the forward face extending in a plane generally upright and from side to side of the truck, said forward cab face including a movable panel carrying said windshield, generally vertical hinge means on said cab structure supporting said movable panel for pivotal movement about a generally vertical axis between a normal position and an extended position, said movable panel in said normal position having a portion proximate to said steering wheel extending across said path and in said extended position having said proximate portion disposed forwardly of said steering wheel clearance position, whereby said steering wheel is free of obstruction by said panel in its movement from said operational position to said clearance position, the hinge means being so constructed and disposed to cause said movable panel to swing between said normal position and extended position without interference with the mast when the mast is in a generally vertical position.

4,392,670

PIVOTED STEERING COLUMN FOR LIFT TRUCK

Donald L. Schultz, Georgetown, Ky., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 27, 1981, Ser. No. 238,889
Int. Cl.³ B62D 1/18
U.S. Cl. 280—775 2 Claims



1. A narrow profile adjustable steering column assembly for lift trucks and the like comprising,

a lower fixed mounting assembly including an upwardly opening first housing,

an upper steering column assembly pivoted about a transverse axis on said lower fixed mounting assembly and including a steering post and a power steering unit for energizing a remote power steer wheel to steer the lift truck,

a pre-pressurized gas cylinder actuator located in said first housing and pivotally connected between said upper and lower assemblies continuously urging said upper assembly to a forward tilted non-operative position,

a locking cylinder located in said first housing and pivotally connected between said upper and lower assemblies for holding said upper assembly in a locked operative position,

a second housing surrounding said upper steering column assembly,

said second housing being of approximately the same width as the said first housing and the two housings jointly providing a narrow profile minimizing the interference with the operator's view past the steering column assembly, and

an operator control member mounted on said second housing and connected internally of both said housings for unlocking said locking cylinder to allow said cylinder actuator to tilt said upper assembly to said non-operative position.

4,392,671

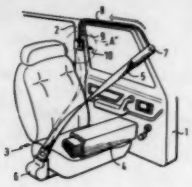
SECURING DEVICE FOR THE SAFETY BELT OF A RESTRAINING SYSTEM

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Jan. 8, 1981, Ser. No. 223,427
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1980, 3001090
Int. Cl.³ B60R 21/00
U.S. Cl. 280—802 7 Claims

1. A restraining system for motor vehicles, especially a passive restraining system, with a safety belt and a securing

device for the safety belt, comprising a seat belt for restraining a person in a seat of the vehicle, a slider track disposed in the vehicle with one end of said seat belt slideable in the slider track, a movable securing element for locking said one end of the seat belt at the end of the track, spring means with a force sufficient to urge said movable securing element in the path of the belt end in the slider track but of insufficient force to



prevent the belt end from sliding into and away from the end of the track, an inertial mass sensor in which the inertial mass is activated at the occurrence of an acceleration or a tilting force which exceeds a predetermined value, said activation being movement of said inertial mass in the direct path of movement of said movable securing element without moving it to block movement of the securing element retaining it in locked position to lock said belt end.

4,392,672

WEBBING RETRACTOR

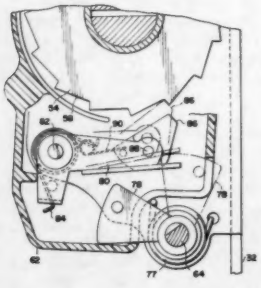
Toshimasa Yamamoto; Mamoru Mori, both of Okazaki, and Eiichi Kinaga, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Nov. 28, 1980, Ser. No. 211,454

Claims priority, application Japan, Nov. 29, 1979, 54-165206[U]

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—803 **9 Claims**



9. A webbing retractor for winding an occupant restraining webbing in a seatbelt system for protecting an occupant in an emergency of a vehicle, comprising:

(a) a frame secured to a center pillar of the vehicle;

(b) a takeup shaft pivotally supported on said frame for winding one end of said occupant restraining webbing;

(c) a first spiral spring secured at one end thereof to said takeup shaft;

(d) a ratchet wheel pivotally supported on said frame and secured thereto with the other end of said first spiral spring;

(e) a second spiral spring being stronger in bias than said first spiral spring, secured at one end thereof to said ratchet wheel and secured at the other end thereof to said frame; and

(f) a locking device, part of which is disposed within a moving path of the vehicle door for preventing said ratchet wheel from rotating in the windup direction of the webbing when the vehicle door is closed.

4,392,673

SEATBELT SYSTEM

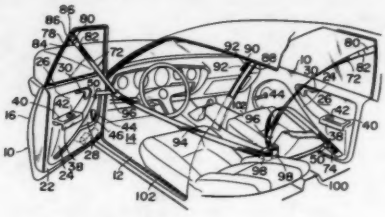
Ichiro Suzuki, Nagoya; Jun Yasumatsu, Toyota; Yoshikazu Imai, Toyota, and Masanao Motonami, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 3, 1980, Ser. No. 193,831

Claims priority, application Japan, Oct. 5, 1979, 54-138763[U]

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—804 **10 Claims**



1. A seatbelt system for an automotive vehicle having a door and an occupant restraining webbing, said seatbelt system comprising:

a raised door arm structure on the inside of the door, said arm structure protruding inwardly and extending approximately from one end of the door to the other end thereof;

a longitudinally extending slit defined through the undersurface of said arm structure; and

belt guide means in said arm structure, said belt guide means being movable longitudinally within said arm structure and guiding said webbing through said slit from within said arm structure, whereby at least a part of said webbing guided by said belt guide means is out of sight from above and under said arm structure.

4,392,674

ICE SKATE SCABBARD

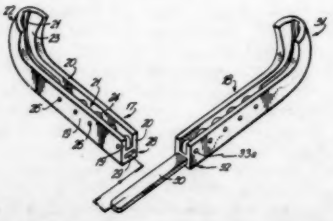
Marc A. Evon, 4070 Kennedy Dr. E., Windsor, Ontario, Canada (N9G 1X8)

Continuation-in-part of Ser. No. 89,542, Oct. 29, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,398

Claims priority, application Canada, Apr. 2, 1979, 324614

Int. Cl.³ A63C *3/12*

U.S. Cl. 280—825 **8 Claims**



1. An ice skate scabbard comprising, in combination:

(a) two generally identical halves arranged for engaging respective ends of an ice skate blade to provide protective

cover of both said ends and of a substantial portion of the runner part thereof;

(b) each of said halves comprising longitudinal, normally horizontal channel means for receiving said runner part, each respective channel means merging at a first end of the respective half with an upwardly turned first end portion, a second end portion of each half being generally straight, each second end portion having a step-on outer surface and two exterior side walls, and a face wall facing away from the respective first end and adapted to abut against the face wall of the other half, each side wall having an elongate groove-like depression extending generally parallel with said step-on surface;

(c) a pair of generally identical tension springs, each anchored, at a first anchor point, to one of said halves, and, at a second anchor point, to the other one of said halves;

(d) said anchor points being each generally coincident with the respective groove-like depression, and being spaced from the respective face wall;

(e) said springs being each coextensive with and received in the respective groove-like depressions of the two halves at the respective sides of the scabbard;

(f) said springs being under tension when said face walls abut against each other,

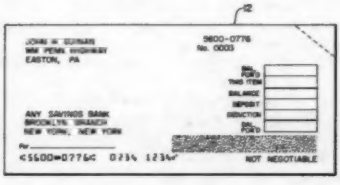
whereby the face walls abutting against each other, the grooves, and the springs co-operate to maintain alignment of the two halves.

4,392,675

CHECKBOOK COMPRISING ALTERNATE CHECK BLANKS AND CHECK STUBS

Albert C. Winiarski, Nazareth, Pa., assignor to Christmas Club, Easton, Pa.

Filed Jan. 19, 1981, Ser. No. 226,346
Int. Cl.³ B41L 1/24
U.S. Cl. 282—23 R **1 Claim**



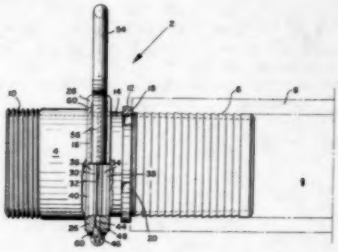
1. A checkbook comprising a cover, alternate check blanks, and check stubs of equal width, said check blanks removably attached and said check stubs fixedly attached at their left-hand end to said cover and to a backing material which extends beyond the right-hand edge of said check blanks and check stubs a distance approximately equal to the width of said check blanks, said check blanks being provided with indicia to accommodate the date, payee, the amount of the check in numeric and language form and the payor's signature, as well as optional information, said check stubs being provided with a pressure sensitive coating thereon, optional information on each said check stub duplicating said optional information on said check blank positioned immediately above said check stub, a darkened area immediately below the indicia for said payor's signature on the check blank immediately above said check stub, whereby said payor's signature is rendered illegible on said check stub, and indicia identifying and providing space for, in descending order, balance forward, the numeric amount of the check immediately above said check stub, the balance, deposit, deduction and balance forward, and a blank area on said check stub immediately below the indicia on said check blank immediately above said check stub accommodating the date, payor, and amount of said check in language form, a plurality of check ordering forms of the same size as said check blanks for ordering individual truncated checks retained by the financial institution on which said checks are drawn, removably attached at their left-hand end to said cover, each said form having indicia to accommodate multiple truncated check orders, said upper side of said backing material being provided with indicia for a check register and said backing material being folded at the right-hand edge of said check blanks, whereby said backing material may be readily inserted between a check stub and the check blank thereunder so as to prevent writing from appearing on other check stubs thereunder while a check blank and check stub above said backing material is being filled in.

4,392,676

HOSE HANDLING DEVICE

Robert T. Jones, Morrisville, Pa., and Martin B. Harrison, Trenton, N.J., assignors to Goodall Rubber Company, Trenton, N.J.

Filed Feb. 22, 1982, Ser. No. 350,812
Int. Cl.³ F16L 3/00, 27/00, 11/00
U.S. Cl. 285—61 **8 Claims**



1. A hose handling device comprising:

a fitting adapted to be secured to one end of a hose having a peripheral groove in its exterior surface;

a ring mounted in said groove for relative rotational movement with respect to said fitting; and

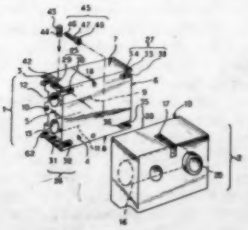
an eye adapted to be engaged by a hook fixedly secured to said ring.

4,392,677

CONNECTING DEVICE FOR PNEUMATIC APPARATUS

Pierre Hardouin, Nanterre, France, assignor to La Telemecanique Electrique, France

Filed Dec. 1, 1980, Ser. No. 211,963
Claims priority, application France, Nov. 30, 1979, 79 29821
Int. Cl.³ F16L 39/00
U.S. Cl. 285—137 R **5 Claims**



1. In a connecting device for pneumatic bases each having two opposed parallel coupling faces provided with orifices to be associated, and a support face perpendicular to the former and adapted to receive a removable pneumatic switching com-

ponent, two opposed coupling faces of two adjacent bases being applied one against the other by means of screws the axes of which are inclined with respect to these faces, and which each have a threaded end cooperating with a nut situated in a housing of one of the bases, a head opposite to this end bearing on a shoulder of an adjacent base, and an intermediate portion placed in two channel portions one in extension of the other, these portions being situated respectively between the common plane of two coupling faces at which they open, and respectively the nut and the shoulder, the improvement which comprises the nut is constituted by an element which pivots about an axis parallel to said coupling faces and which is placed in a base of a first portion of channel opening at the support face, the length of the screw being such that its head is disposed below said support face when its axis is perpendicular to the latter, and said head is pressed on a shoulder disposed in a second portion of channel opening at the support face of an adjacent base and in the vicinity of said support face, when the axis of the screw is inclined, two screws being respectively placed in two parallel planes between which open the orifices to be connected.

4,392,678

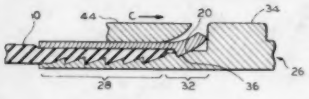
END FITTINGS FOR FLEXIBLE HOSES

Rudolph A. Adamczyk, Ludlow, Mass., assignor to Titeflex Corporation, Springfield, Mass.

Continuation of Ser. No. 49,645, Jun. 18, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,341

Int. Cl.³ F16L *33/20*

U.S. Cl. 285—256 **3 Claims**



1. An end fitting for flexible polytetrafluoroethylene hoses, said end fitting being made of two integral metal piecepart means, a first of said piecepart means having an initial cylindrical form of a collar means having a first and substantially annular interlocking shoulder means of relatively small inside diameter formed around an internal surface near one end thereof, said collar having a smooth and unbroken inside diameter extending from said annular shoulder means throughout a middle region of said collar with a second inside diameter which is larger than said small inside diameter, said inside diameter of said middle region snugly receiving the outside diameter of said hose, a compression relief end region on an opposite end of said collar having an inside diameter which is larger than the second inside diameter, said end region having an inside diameter which is larger than the outside diameter of said hose, a tapered region joining said end region and said middle region, and said second piecepart means being in the form of an insert means having a second and substantially annular interlocking groove means formed around an external surface thereof, said second piecepart having an abutment wall on one side of said annular groove interlocking means, the second piecepart means having an end on the opposite side of said second annular groove interlocking means with an outside diameter which slips into the inside diameter of said hose, a series of annular serrations formed along the length of said one side, each annular serration having a vertical wall on a side nearest said second annular interlocking means, each serration having a sloping surface beginning at the top of said vertical wall and tapering downwardly with a progressively smaller outside diameter to the root of the vertical wall on the adjacent serration, the middle region of said collar means being reduced in diameter to capture said flexible hose between said collar and the serrated end of said second piecepart means which slips into said hose, said collar sliding over said hose until said one end comes into contact with said abutment wall, said two pieceparts being joined by sliding a swaging die over the outside of said collar which die uniformly extrudes the metal of said collar and reduces the outside diameter and the collar wall thickness of the first piecepart as said die slides from said compression relief end toward said one end of said collar, said first and second interlocking means mating and meshing together in close and intimate metal-to-metal contact when said collar is reduced in diameter by the extruding metal of said collar, said annular interlocking means on said collar initially pivoting and canting into the annular interlocking member on said second piecepart means responsive to sliding of said swaging die and thereafter forming said intimate contact.

4,392,679

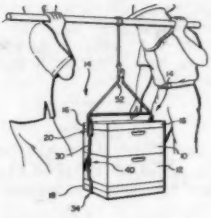
BEEHIVE CLAMPING AND TRANSFER DEVICE

Walter P. Barnes, 671 Hemlock St., Macon, Ga. 31201, and Carlo Emilio, Jr., 4070 Atwood Dr., Macon, Ga. 31204

Filed May 14, 1981, Ser. No. 263,759

Int. Cl.³ A01K *51/00*; B66C *1/16*

U.S. Cl. 294—15 **12 Claims**



1. A device for securely maintaining beehive elements together during transit, including top and bottom elements with a hive body element therebetween, comprising:

a clamp for each of at least two respective opposite sides of the beehive, each clamp including;

a pair of hooks for respectively hooking onto the top and bottom beehive elements;

a chain connected to one of the hooks; and

a turnbuckle interconnecting the chain to the other hook,

the turnbuckle of each clamp being adjustable to securely clamp the beehive elements together and prevent relative movement therebetween; and

said hooks respectively hooking onto the top beehive element on each clamped side include a lift mounting portion engageable with lift means for lifting said beehive elements during transit thereof.

4,392,680

SPREADER SAFETY DEVICE

Hunter Wolfe, 121 Yardley Ave., Fallsington, Pa. 19054

Continuation-in-part of Ser. No. 110,815, Jan. 10, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,943

Int. Cl.³ B66C *1/34*; F16G *11/00*

U.S. Cl. 294—78 R **5 Claims**

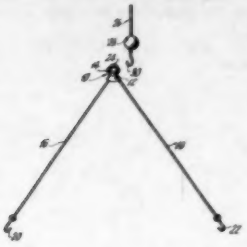
1. A safety collar for use in combination with a plurality of spreader cables having object gripping members disposed on their terminal ends:

said safety collar being formed as an annular member formed as generally truncated cones flaring outwardly towards both ends, said safety collar being freely slideable over said plurality of cables but sized sufficiently small so that it will not pass over said object gripping members;

a jamb block centrally disposed in said safety collar, said jamb block having a plurality of openings corresponding in number to the number of said cables, each of said openings having a diameter of sufficient size to permit said cables to freely slide therethrough; and

upon the separation of said plurality of cables, when said

gripping means are attached to an object, said safety collar being urged upwardly along said cables and when said gripping members are not attached to an object, said collar being urged downwardly by the action of gravity to prevent said cables and said gripping members from swinging.



4,392,681

ROTATING BODY SYMPATHETIC VIBRATION ABSORBER

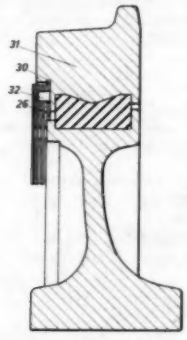
Erwin Raquet, Witten, Fed. Rep. of Germany, assignor to Fried, Krupp Huttenwerke AG, Bochum, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 154,810

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922585

Int. Cl.³ B60B *17/00*; F16F *15/22*; F16H *55/14*

U.S. Cl. 295—7 **4 Claims**



1. A vibration absorber for damping the determining resonance vibrations of rotating bodies through creating sympathetic vibrations to sympathetically dampen the wheel vibrations, in particular rail wheels, comprising:

several plates forming a unit which establish a mass;

intermediate layers of compressible damping material separating said plates from each other so that said damping material is compressed during vibration of said plates;

means connecting said plates with the rotating body at at least one point; so that the plates vibrate like the tines of a tuning fork and a vibration nodal point is established at said connecting means and

an intermediate layer of damping material between said plates over a large remaining area thereof and coupled by connecting means to the rotating body;

the geometric dimensions of said plates and said intermediate layers and the Shore hardness of said damping material of the intermediate layers are selected such that all plates oscillate at substantially the same natural frequency of the rotating body to be damped, and the amplitudes and phases of the vibrations of the individual plates differ, in such a manner, with respect to one another, that the damping material is distorted as strongly as possible within its elastic limit.

4,392,682

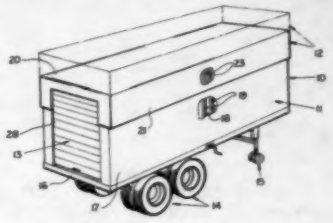
EXPANSIBLE AND RETRACTABLE VEHICLE BODY

Kasper Norkus, Jr., 10930 S. Harlem Ave., Worth, Ill. 60482

Filed Aug. 4, 1981, Ser. No. 289,883

Int. Cl.³ B62D *33/08*

U.S. Cl. 296—26 **15 Claims**



3. An expansible and contractable trailer body which comprises a lower main body with a bottom floor, upright side and front end walls, a rear doorway and an open top, a roof top body telescoped over the open top of the lower body, means raising and lowering said top body on said lower body, an overhead door closing said doorway, and telescoped door guiding tracks on said top and lower bodies whereby said door will close the entire doorway regardless of variations in the height thereof caused by the raising and lowering of said top body.

4,392,683

RETRACTABLE ASHTRAY, PARTICULARLY FOR MOTOR VEHICLES

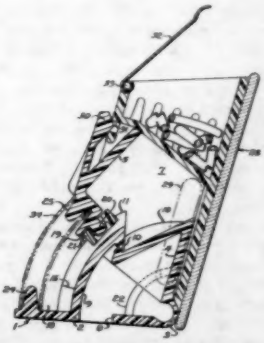
Alberto Bassi, Turin, Italy, assignor to ITW Fastex Italia S.p.A., Turin, Italy

Filed Aug. 24, 1981, Ser. No. 295,275

Claims priority, application Italy, Sep. 8, 1980, 24538 A/80

Int. Cl.³ B60M *3/12*

U.S. Cl. 296—37.9 **5 Claims**



1. A retractable ashtray, particularly for motor vehicles, characterized in that its release mechanism is integrally made of plastic material and comprises a first and a second wall hinged to each other along a common edge by a thinning of their thickness at said edge, and a third wall integral with said second wall and opposite thereto, said third wall bearing a pin

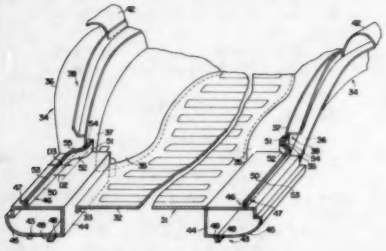
on which an idle pawl is mounted, said first wall having arcuate guide ribs thereon which are concentric to the hinge axis, and are intended to guide the pawl during relative movements of the two walls hinged to each other when the ashtray is moved from its retracted out-of-use position to its extracted in-use position and vice versa, and to provide a stop abutment for the pawl at said two ashtray positions as well as a hook, and said second wall also bearing a hook intended to engage said hook of said first wall, a spring being interposed between said first and said third wall which urges said two hooks toward engagement.

4,392,684

VEHICLE BODY STRUCTURE

Seikichi Yoshitsugu, Sayama, and Minoru Shimatsu, Koganei, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 27, 1981, Ser. No. 239,031
Claims priority, application Japan, Feb. 29, 1980, 55-27020
Int. Cl.³ B62D *25/02*
U.S. Cl. 296—185 3 Claims



1. A vehicle body structure, comprising:

a pair of rear wheel housing each having inner and outer housing half portions, and inner and outer flange portions respectively extending radially outwardly from the outer circumference of said housing half portions, said inner and outer flange portions being integral with said housing half portions and connected to each other for forming in combination said rear wheel housing; said outer flange portion being bent in a lateral direction of said rear wheel housing;

a pair of rear pillar inner panels each having a lower end portion connected to each of said outer flange portions; and

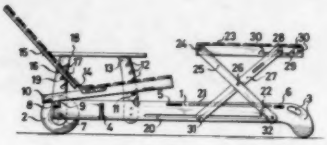
a pair of side sills extending in parallel with each other and projecting forwardly from said rear wheel housings, respectively, each of said side sills having inner and outer side sill half portions, and inner and outer flange portions respectively extending upwardly from the upper ends of said side sill half portions, said inner and outer flange portions being integral with said side sill half portions and connected to each other for forming in combination said side sill, said inner and outer flange portions of said side sill extending in longitudinal directions of said side sill to be bent in a lateral direction of said side sill in longitudinal alignment with said inner flange portion of said rear wheel housing for sandwiching said inner flange portion of said rear wheel housing therebetween.

4,392,685

COMBINED LAWN CHAIR AND TABLE RECLINER

Franz X. Leonhart, 8385 Harburg, near 8385 Pilsting, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 228,160
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1980, 3002926
Int. Cl.³ A47B *85/02*; A47C *7/50*
U.S. Cl. 297—119 3 Claims



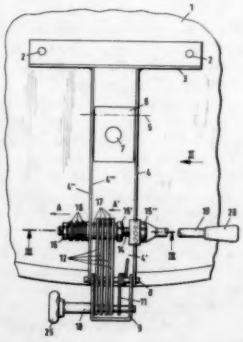
1. An adjustable recliner chair with a footrest, comprising a pair of longitudinally extending spaced side members (1) having inwardly facing inner surfaces forming a base frame, an adjustable chair assembly (10,15) connected to one end of said side members, a footrest portion (23), vertically adjustable means (24–32) connected with said side members in front of said chair assembly and with said footrest portion, two longitudinal spaced grooves (20,21) on each inner surface extending from substantially in front of said chair assembly to adjacent the opposite end of said side members (1), a cross groove (22) connecting the two longitudinal spaced grooves in front of the ends thereof adjacent said opposite end of the side members, said vertically adjustable means (24–32) having lower ends, and pivot studs (31,32) protruding from the lower ends of said vertically adjustable means and engaged in said grooves on the inner surfaces, whereby said vertically adjustable means are longitudinally displaceable on said side members for vertically adjusting said footrest portion to form a raised table.

4,392,686

ADJUSTABLE OFFICE CHAIR

Herbert Beer, Wendelstein, Fed. Rep. of Germany, assignor to Steifensand Sitzmobel- und Tischfabrik, Inh., Fed. Rep. of Germany

PCT No. PCT/EP80/00042, § 371 Date Mar. 4, 1981, § 102(e) Date Mar. 4, 1981, PCT Pub. No. WO81/00044, PCT Pub. Date Jan. 22, 1981
PCT Filed Jul. 4, 1980, Ser. No. 243,951
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927377
Int. Cl.³ A47C *1/027*
U.S. Cl. 297—376 7 Claims



1. Seating furniture, in particular an adjustable office chair,

with a support structure fixedly attached to a foot stand, a seat carrier and a back rest, wherein at least the inclination of two of the aforementioned parts is variable with respect to each other and may be immobilized in the position desired by means of plates, separated by intermediate shims, and locked by friction, wherein the frictional lock is established with the aid of a clamp bolt and the plates are equipped each with an elongated hole surrounding the clamp bolt, wherein further a relative displacement occurs between the plates and the intermediate shims on the one hand and the clamp bolt on the other, during establishment and release of a clamping position, and wherein further an actuating lever capable of being moved by a spring assembly into a position corresponding to the clamped position, is provided, characterized in that the spring assembly consists of plate springs surrounding the clamp bolt, said spring assembly is supported between a thrust bearing of the clamp bolt on a first side and one of the parts to be adjusted with respect to each other and clamped against each other on a second side, thereby acting through said thrust bearing directly on the clamp bolt and displacing the latter into the clamping position, actuation of the lever moves the clamp bolt, by direct action through said thrust bearing, against the springs, from the clamping position into the release position.

4,392,687

LIFTING AND TILTING TRAILER

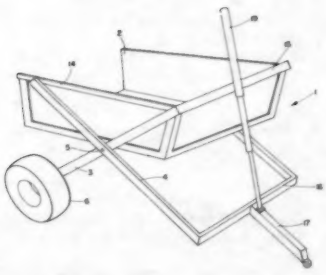
Denis O'Connell, Mallow, Ireland, assignor to Institute for Industrial Research & Standards, Dublin, Ireland

Filed May 20, 1981, Ser. No. 265,360

Claims priority, application Ireland, May 21, 1980, 1053/80; Apr. 8, 1981, 792/81

Int. Cl.³ B60P *1/34*

U.S. Cl. 298—5 **12 Claims**



1. A trailer comprising:

a container;

a pair of co-operating scissors lifts laterally spaced apart for reception of the container therebetween, each scissors lift comprising a first and second support arm pivotally connected intermediate their ends to define a scissors pivot;

means for moving the support arms relative to each other to operate the scissors lift;

a pair of wheel axles, the wheel axles being respectively connected to the first support arms at their rear ends;

a mounting means for pivotal connection of the front end of the first arms to the container, the mounting means defining longitudinally spaced apart tilt and lift pivot positions for the container relative to the scissors pivot; and

engagement means adjacent the rear end of the second arms to slidably engage the container, the engagement means being disengageable from the container when the first arms are in the tilt position.

4,392,688

CROP OR PRODUCT CARRIER

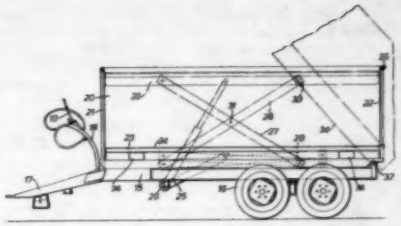
James A. E. S. McIntyre, Wythall Estate, Wythall, Walford, Ross-on-Wye, Herefordshire HR9 5SD, England

Filed Sep. 26, 1980, Ser. No. 191,812

Claims priority, application United Kingdom, Aug. 4, 1980, 8025368

Int. Cl.³ B60P *1/16*

U.S. Cl. 298—22 R **6 Claims**



1. A crop or product carrier comprising a container having side walls, end walls and a base, at least one fluid powered ram forming part of a lifting and lowering mechanism enabling the base to be raised and to be lowered progressively with respect to the side walls and end walls as the crop or product quantity increases within the container, a pivot at one end of the container enabling the base, side walls and end walls to pivot about said one end to tip the container for unloading, the end wall at said one end of the container being operable to provide an outlet opening for discharge of the crop or product during unloading, locking means for securing the base in the lowered position within the container, the means for raising and lowering the base also acting to tip the container about the pivot for unloading when the locking means secures the base in the lowered position.

4,392,689

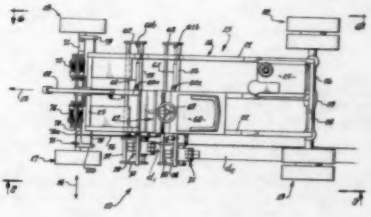
PAVEMENT MILLING APPARATUS

Robert H. Moore, 231 Hamlet St., Los Angeles, Calif. 90042, and Larry O. Engels, 90564 Link Dr., Eugene, Oreg. 97402

Filed Apr. 20, 1981, Ser. No. 255,710

Int. Cl.³ E21C *47/00*

U.S. Cl. 299—39 **14 Claims**



1. In equipment for removing pavement, the combination comprising

(a) a vehicle adapted to be driven over the pavement,

(b) milling rotor means and drive means therefor, the milling rotor means including cutters projecting at the periphery of the rotor means for cutting the pavement as the rotor means is driven in rotation, and

(c) structure on the vehicle carrying the milling rotor means for adjustable bodily displacement relative to the vehicle and to selected positions wherein vehicle weight is ex-

erted downwardly on the milling rotor means during cutting of pavement,

(d) the vehicle being oriented for generally longitudinally forward or rearward travel, said rotor means including two rotors at the same side of the vehicle and generally in alignment with one another forwardly and rearwardly,

(e) said structure including first actuator means operatively connected with the rotor means to displace the rotor means generally downwardly relative to the vehicle,

(f) said structure including linkage means suspending the rotor means for downward and forward swinging in response to said operation of the first actuator means,

(g) said structure including primary member means respectively suspending the rotor means for adjustable lateral displacement relative to the vehicle, and at the same side thereof,

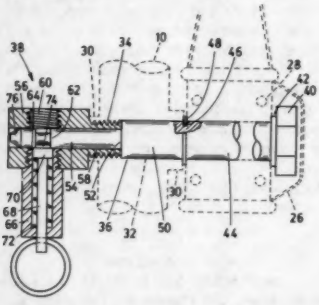
(h) and second actuator means operatively connected with said primary member means to effect said adjustable lateral displacement thereof relative to the vehicle.

4,392,690

QUICK RELEASE WHEEL MOUNT

Raymond A. Anderson, 360 Capital Ave., Battle Creek, Mich. 49017

Filed Mar. 9, 1981, Ser. No. 242,015
Int. Cl.³ B60B *37/00*
U.S. Cl. 301—121 **6 Claims**



1. A quick release attachment for the wheels of collapsible chairs comprising:

a body member attachable to the frame of a chair in place of a wheel axle,

an axle element having one end removably extendable through the existing axle hole of the frame and into said body member and having an annular groove adjacent said one end arranged to be located within said body member when the latter is attached to said frame,

a lock support member having an externally threaded end engagable in a tapped hole provided therefor in said body member in transversely intersecting relation to the groove in said axle element,

a lock pin slidably positioned in said support member and extending through the opposite end of said support member,

a spring in said support member biasing one end of said pin into said groove in said axle element,

a finger grip element connected to said lock pin externally of said support member,

said axle element having a head on the opposite end thereof from said body member engagable with one one end of a wheel of the wheelchair,

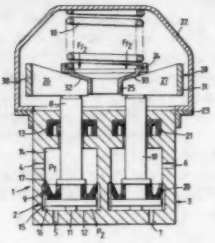
said axle element further defining an external groove spaced from said head and adapted to receive a snap ring to retainingly engage the opposite end of a hub positioned against said head.

4,392,691

DUAL-CIRCUIT PRESSURE CONTROL VALVES

Bernd Schopper, Frankfurt am Main; Derek Lowe, Glashuetten; Hans-Dieter Reinartz, Frankfurt am Main, and Peter Tandler, Falkenstein, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 30, 1980, Ser. No. 221,250
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002135
Int. Cl.³ B60T *11/34*
U.S. Cl. 303—6 C **21 Claims**



1. A dual-circuit pressure control valve comprising:

two control pistons disposed in a housing in a parallel side-by-side relationship, each of said two pistons being associated with a different one of two brake circuits; and

an arrangement associated with said housing to apply a preloading force to each of said two pistons such that, upon failure of one of said two circuits, said preloading force on that one of said two pistons associated with the other of said two circuits is increased, said arrangement including

a spring disposed adjacent at least one of said two pistons to generate said two preloading forces,

means disposed in an operative relationship with said spring and at least one of said two pistons to apply each of said two preloading force to a different one of said two pistons, and

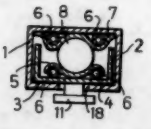
a carrier bridge coupled to and in contact with each of said two pistons in a non-tilting manner to allow a slight relative movement between said two pistons when both of said circuits are operative to adjust the position of said means to enable synchronizing each point of application of said two preloading forces.

4,392,692

SEAT SUPPORT SLIDE TRACK STRUCTURE

Ignaz Vogel, Kleinsteinbacherstr.42, Karlsruhe, Fed. Rep. of Germany (7500)

Filed Jul. 13, 1981, Ser. No. 282,515
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029127
Int. Cl.³ F16C *29/10*; F16B *7/10, 21/12*
U.S. Cl. 308—6 R **9 Claims**



1. A slide track structure especially for supporting passenger seats in different positions, said slide track structure comprising two tracks movable relative to each other in longitudinal direction and having opposed surfaces; guide strips disposed on the surfaces of said tracks facing each other; elastomer support means disposed between at least one of said guide strips and the

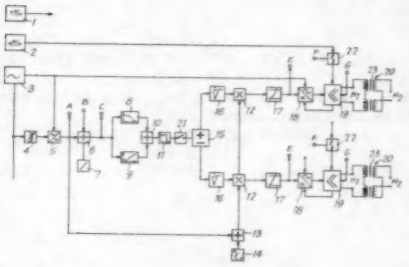
associated track for resiliently supporting said guide strip on said track, said guide strips being waved to define therebetween a passage of essentially circular cross-section, and at least two balls disposed in said passage for supporting one of said tracks on the other, said one track being a square tube and the other being a U-track received within said square tube so as to engage said guide strips, said elastomer support means, said balls and the other U-track enclosed within said square track to prevent rattling when no load is supported by said slide track structure, said square tube having at least one slot formed in its bottom side and said U-track having connected thereto a mounting base, which extends through said slot in said square tube to permit movement of said square tube relative to said U-track when said mounting base is mounted on a support structure.

4,392,693

REDUNDANT ACTIVE ELECTROMAGNETIC BEARING

Helmut Habermann, and Maurice Brunet, both of Vernon, France, assignors to Societe Europenne de Propulsion, Vernon, France

Filed Feb. 25, 1982, Ser. No. 352,265
Claims priority, application France, Mar. 9, 1981, 81 04646
Int. Cl.³ F16C *39/00*
U.S. Cl. 308—10 **6 Claims**



1. A redundant active electromagnetic bearing for supporting a movable member, comprising:

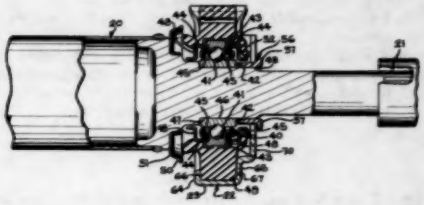
a first set of electromagnet coils wound on an armature having double-pole parts and a second set of electromagnet coils would on said armature, a first and a second detection device for sensing the position of the movable member, a first control circuit connected to said first detection device and capable of being connected to said first set of coils for controlling the supply of said first set of coils in response to signals delivered by the first detection device in order to keep the movable member in a predetermined position, a second control circuit connected to said second detection device and capable of being connected to said second set of coils for controlling the supply of said second set of coils in response to signals delivered by the second detection device in order to keep the movable member in a predetermined position, and switch-over means being provided for connecting either the first set of coils with the first control circuit or the second set of coils with the second control circuit in response to a control signal, wherein the first and the second sets of coils are so placed on said armature that on each double-pole part of said armature are wound one coil of the first set and one coil of the second set and that the successive coils of the first set are all wound in the same direction whereas the coils of the second set which duplicate the coils of the first set are alternately wound in the same direction and in opposite directions with respect to the corresponding coils of the first set.

4,392,694

CENTER BEARING BRACKET

James T. Reynolds, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 17,402, Mar. 5, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,358
Int. Cl.³ F16C *27/06*
U.S. Cl. 308—184 R **7 Claims**



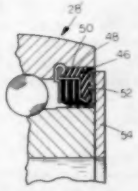
1. A center bearing assembly for resiliently supporting from a rigid support a driven shaft which may be subjected to radial forces and to axial forces in at least one predetermined direction comprising a bearing having a rotatable inner race engaging said shaft, a non-rotatable outer race and a plurality of bearing elements between said inner and outer races, a resilient bushing mounting said outer race, said bushing having first and second sides and an outer edge, a bracket engaging at least a portion of said outer edge and having integral lips engaging said sides adjacent said outer edge, said integral lips retaining said bushing in said bracket, means for mounting said bracket on said rigid support, said bracket further having a flange positioned from said bushing side a predetermined small spacing, said bushing side being unrestrained adjacent said flange, whereby during normal operation said bushing side is spaced from said flange and drive train vibrations are not transmitted to said flange and whereby upon axial movement of such shaft, said bushing side is free to move through such spacing and against said flange to limit axial movement of such shaft.

4,392,695

BEARING

Maurice E. Miller, Stratton, Nebr., assignor to Miller Manufacturing Company, Grand Island, Nebr.

Filed Aug. 10, 1981, Ser. No. 291,240
Int. Cl.³ F16C *33/78*
U.S. Cl. 308—187.2 **8 Claims**



1. A bearing, comprising,

an inner bearing ring having a central opening for receiving a shaft therein, said inner ring having inner and outer surfaces and opposite sides,

an outer bearing ring spaced from said inner ring and having inner and outer surfaces and opposite sides,

a plurality of spaced apart ball bearings between said inner and outer bearing rings,

a first ring-shaped seal between said inner and outer bearing rings at one side thereof,

a second ring-shaped seal between said inner and outer bearing rings at the other side thereof,

said first and second seals embracing and frictionally engaging the outer surface of said inner bearing ring,

a first ring-shaped shroud cap secured to said outer bearing ring at one side thereof and embracing said first seal, said first shroud cap and said outer bearing ring defining a first annular groove,

a second ring-shaped shroud cap secured to said outer bearing ring at the other side thereof and embracing said second seal, said second shroud cap and said outer bearing ring defining a second annular groove,

and a compressible sealant material in said first and second grooves,

said sealant material substantially filling said grooves and being compressible against said shroud cap to prevent dust from entering the interior of the bearing between said first and second seal means and said bearing rings.

4,392,696

DRAWERS

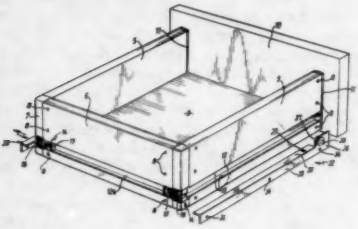
Leon G. Litchfield, and Terence Hardy, both of Belper, England, assignors to L.B. (Plastics) Limited, Belper, England

Filed Oct. 30, 1980, Ser. No. 202,090

Claims priority, application United Kingdom, Nov. 2, 1979, 7938123

Int. Cl.³ A47B *88/00*

U.S. Cl. 312—330 R **13 Claims**



1. A drawer having longitudinal tracks in the opposite side walls thereof, a pair of members mounted one at each of the rear corners of the drawer and moveable between extended and retracted positions, said members being arranged to extend across the rear ends of the respective tracks in their operative positions and being arranged to retract clear of the rear ends of the tracks in their inoperative positions, and rotary actuating means accessible from within the drawer and operable to effect movement of said members between said positions, said actuating means comprising a stud device having a head adapted to seat against the inner surface of the rear wall of the drawer and provided with a formation engageable by an actuating member or tool to enable rotation of the actuating device from within the drawer, a body portion rotatably received in an aperture in said rear wall, and an eccentric pin projecting from said body portion into engagement with the associated member to impart sliding movement thereto on rotation of said stud device, and said actuating means incorporating over-centre locking means operable to retain said members in their extended operative positions until released by rotation of the actuating means.

4,392,697

DRAWER STOP

William L. Kousens, 1736 Kadwell Way, El Cajon, Calif. 92021

Filed Feb. 17, 1981, Ser. No. 234,882

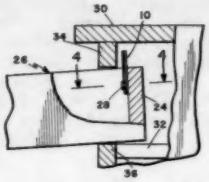
Int. Cl.³ A47B *88/00*

U.S. Cl. 312—348 **2 Claims**

1. A one piece drawer stop for preventing accidental removal of a drawer from a drawer receptacle, comprising:

a substantially flat body of relatively stiff material with some resiliency, including a pair of elongated curved bosses extending longitudinally of said body near the outer edges thereof, and along the entire length of said body;

an opening in said body between said bosses near one end thereof for receiving a fastener to secure the drawer stop to said drawer and provide a pivot axis for said drawer stop;



said drawer stop being rotatable about said axis with only the curved portions of said bosses engaging the drawer surface whereby said drawer stop can be snuggly affixed to said drawer without loosening said drawer stop when it is rotated between the operative drawer stopping position and the inoperative drawer removal position.

4,392,698

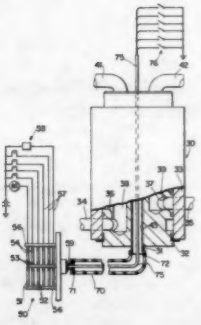
INDUSTRIAL CRANE WITH ROTARY ELECTRICAL CONNECTOR

Lex A. Mellott, Warfordburg, Pa., assignor to JLG Industries Inc., McConnellsburg, Pa.

Filed Dec. 30, 1980, Ser. No. 221,389

Int. Cl.³ H01R *39/02*

U.S. Cl. 339—10 **12 Claims**



1. A vehicle comprising:

(a) a chassis, an upper works, means mounting the upper works for rotation on the chassis about a vertical axis, and means for rotating said upper works,

(b) cylindrical electrical connector means for tranferring electrical energy between a fixed element and a rotary element and including a fixed part, a rotary part, and axially spaced conductor bands and contacts on said parts,

(c) means mounting said connector means on said chassis remote from the axis of rotation of the upper works,

(d) means for rotating said rotary part of said connector means from said upper works,

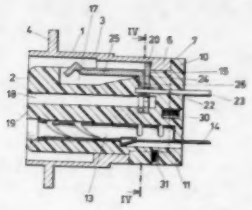
(e) flexible electrical conductors extending through a hollow shaft and connected to said connector means and to electrical means on said upper works.

4,392,699

ELECTRICAL CONNECTOR

Bernhard Weingartner, Feldkirch, Austria, assignor to Neutrik Aktiengesellschaft, Liechtenstein

Filed Mar. 13, 1981, Ser. No. 243,660
Claims priority, application Austria, Mar. 19, 1980, 1496/80
Int. Cl.³ H01R 13/652
U.S. Cl. 339—14 P 11 Claims



1. An electrical connector assembly particularly adapted for attachment to the chassis of an appliance comprising: a housing defining a generally longitudinal axis; an insertion piece having therein electrical contact means for effecting desired electrical connection, said insertion piece being received within said housing from one end thereof; flange means on one end of said insertion piece adapted to engage said housing to act as a stop member when said insertion piece is placed within said housing; a slotted recess extending transversely to said longitudinal axis defined in said insertion piece a distance from said flange means; a locking lug pivotally mounted within said recess; a bore extending through said insertion piece into cooperative relationship with said locking lug to enable a tool to be inserted therein for engagement with said locking lug; engagement means on said locking lug adapted to enable said locking lug to be engaged by said tool to pivot said locking lug between a locking position to effect locking engagement between said insertion piece and said housing and a nonlocking position releasing said locking engagement; and shoulder means defined on the interior of said housing and spaced from said one end thereof an interval corresponding to the distance between said slotted recess and said flange means, said shoulder means being adapted to be engaged by said locking lug when said locking lug is in said locking position.

4,392,700

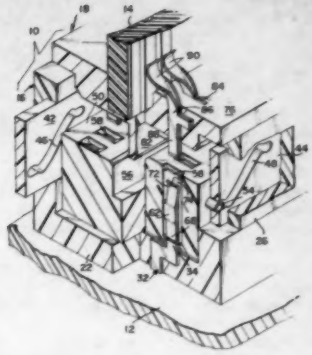
CAM ACTUATED ZERO INSERTION FORCE MOTHER/DAUGHTER BOARD CONNECTOR

Robert L. Showman, Hershey, and Robert N. Weber, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 8, 1981, Ser. No. 300,332
Int. Cl.³ H01R 13/629
U.S. Cl. 339—17 M 13 Claims

1. A zero insertion force connector assembly for mounting a daughter circuit board on a mother circuit board comprising:

a receptacle having a housing defining an elongated daughter board receiving cavity with a closed bottom, a carrier block movably mounted in said cavity, cam means mounted in said housing and adapted to move said carrier block with respect to the bottom of said cavity, a plurality of first terminals fixedly mounted in the bottom of said cavity, each said first terminal having a pin portion extending through the bottom and a blade portion extending into said cavity, a like plurality of second terminals mounted in said carrier block each having one end in constant wiping engagement with a respective blade portion of a respective first terminal, and an opposite second



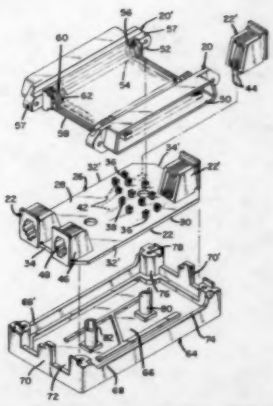
end adapted to make wiping engagement with a contact of said daughter board.

4,392,701

TAP CONNECTOR ASSEMBLY

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 170,199, Jul. 16, 1980. This application Nov. 9, 1981, Ser. No. 319,346
Int. Cl.³ H01R 11/32, 13/512
U.S. Cl. 339—17 R 8 Claims



1. A tap connector assembly for making tap connections to selected conductors in a multi-conductor cable, the tap connector assembly being of the type comprising first and second standard cable connectors, each cable connector comprising an insulating housing having a mating face and a rearward face, a plurality of cable connector terminals in the housing, the cable connector terminals being arranged in two parallel rows which extend between the endwalls of the housing, the cable connectors being in spaced-apart back-to-back relationship with their rearward faces in opposed relationship, the corresponding cable connector terminals in the first and second cable connectors being connected to each other by first conductors which extend between, and have their ends connected to, the corresponding cable connector terminals, at least one modular jack, a selected plurality of the first conductors being connected intermediate their ends to jack conductors in

the modular jack, the tap connector assembly being characterized in that:

the standard cable connectors are located along the opposite side edges of a circuit board, the first conductors being wires which extend across one surface of the circuit board,

a plurality of insulation displacement terminals are mounted in the circuit board, each insulation displacement terminal having at least one wire connecting portion having a wire-receiving slot therein and having a solder post extending from the wire connecting portion, the wire connecting portion extending normally from the one surface of the circuit board and the solder posts extending through holes in the circuit board and from the other surface of the circuit board,

the modular jack being mounted on the one surface of the circuit board adjacent to one of the end edges thereof, the jack conductors having solder post portions extending from the housing in the modular jack through holes in the circuit board and beyond the other surface of the circuit board, a plurality of circuit

board conductors which extend between the solder post portions of the jack conductors and the solder post portions of the insulation displacement terminals, the circuit board conductors being soldered to the post portions, and

the selected first conductors having intermediate portions thereof inserted into the wire receiving slots of the insulation displacement terminals whereby,

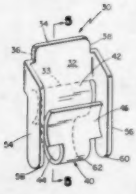
upon coupling standard cable connectors on the ends of cable sections to the first and second standard cable connectors in the tap connector assembly and thereafter plugging a modular plug on the end of a tap cable into the modular jack, the conductors in the tap cable are connected to preselected cable conductors.

4,392,702

SHORTING JUMPER

William B. Walkup, Southboro, Mass., assignor to Ark-les Corporation, Watertown, Mass.

Filed Apr. 2, 1981, Ser. No. 250,435
Int. Cl.³ H01R *31/08*
U.S. Cl. 339—19 **2 Claims**



1. A jumper adapted to electrically connect adjacent ones of an array of uninsulated conductive substantially rigid vertical pins, said jumper being formed of resilient, electrically conductive sheet material and comprising

a generally vertical plate portion having a free upper lengthwise edge and two generally vertical side edges,

a pin-retaining spring portion integrally connected lengthwise to said plate portion and comprising

two cooperating pin-gripping portions each having a length adapted to span at least the greater part of two adjacent pins to be connected, a first said pin-gripping portion being integrally connected lengthwise with said plate portion remote from its said free upper edge, the second said pin-gripping portion being spaced widthwise from said first pin-gripping portion, a neck portion having a length adapted to pass between two adjacent pins to be connected, said neck portion being integrally connected lengthwise to each said pin-gripping portion,

said jumper further providing position stabilizing means comprising two arms,

each said arm being integrally connected to a said side edge of said plate portion and bent toward said second pin-gripping portion at an angle of about ninety degrees to said plate portion,

said arms being lengthwise spaced apart by a spacing adapted to clear the outer surfaces of two adjacent pins to be connected,

said arms extending widthwise from at least about the inner surface of said first pin-gripping portion to at least the junction of said second pin-gripping portion and said neck portion,

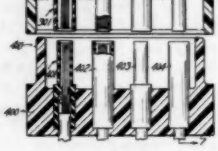
whereby said arms stabilize said jumper to resist tilting thereof and to prevent shorting other adjacent conductive pins.

4,392,703

ELECTRICAL CONDUCTOR HAVING AN INTEGRAL ELECTRICAL CONTACT

James R. Hall, Bainbridge, and William P. Whallon, Jr., Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 90,198, Nov. 1, 1979, abandoned, which is a division of Ser. No. 890,339, Mar. 27, 1978, Pat. No. 4,206,958. This application Jun. 1, 1981, Ser. No. 269,134
Int. Cl.³ H01R *13/28, 11/11*
U.S. Cl. 339—49 R **6 Claims**



1. An electrical cable assembly of the type having wire strands formed into a bundle for releasable connection to another electrical contact formed of a bundle of wires having angled ends, comprising:

a plurality of elongated electrical conductors (**500**) of the type consisting of a strand (**510**) of conductive material surrounded by dielectric material (**520**), each strand having a conductive end portion (**540**) thereof exposed to extend from the dielectric material, the dielectric material otherwise electrically insulating each of the conductive strands (**510**) from one another;

protective means (**572**) medially disposed about the plurality of electrical conductors (**500**) for securing the electrical conductors into a multi-conductor cable, an insulated end portion (**512**) of each electrical conductor (**500**) containing its exposed conductive end portion (**540**) extending from said protective means;

a cable-like assembly (**500A**) comprising the insulated end portions (**512**) of the electrical conductors (**500**) being gathered together; and

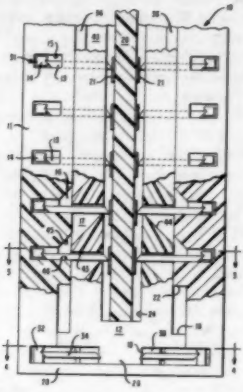
a sleeve (**550**) secured about said cable-like assembly, the exposed conductive end portions (**540**) so assembled forming a mateable bundle extending forwardly from the sleeve in axially aligned, parallel relation, the end of each conductive strand being acutely angled for mating, said angled ends of said strands and said mateable bundles being so configured that said mateable bundle and said another contact can be aligned along their axes and moved into releasable intermingled connection with the angled ends of each bundle entering the other bundle.

4,392,704

LOW INSERTION FORCE PRINTED CIRCUIT CARD CONNECTOR

Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 16, 1981, Ser. No. 274,100
Int. Cl.³ H01R 13/62
U.S. Cl. 339—75 MP 9 Claims



4. A printed circuit board connector of the end entry type comprising:

an insulated base defining an elongated opening;

a series of resilient pins mounted in said insulated base and deflectable at one end within said insulated base, said series of pins positioned along said elongated opening;

a carrier slidably mounted to said insulated base within said defined elongated opening, said carrier defining a slot for receiving the edge portion of a printed circuit board;

a series of individual passageways through said insulated base and said carrier, one end of each said passageways connecting to a corresponding one of said resilient pins, the other end of said passageways corresponding to an associated edge connector on a printed circuit board; and

a series of floating conductors, one each positioned in a passageway with one end of each conductor connectable to an associated resilient pin and the other end connectable to a respective edge contact on a printed circuit board when the printed circuit board is inserted in said carrier and said carrier is slid into said insulated base; and

biasing means connected between said insulated base and said carrier for sliding said carrier to an unloaded position when the printed circuit board is removed, and for maintaining said carrier in a loaded position when the printed circuit board is inserted in said connector.

4,392,705

ZERO INSERTION FORCE CONNECTOR SYSTEM

Howard W. Andrews, Jr., Hershey; Timothy B. Billman, Carlisle, and Robert F. Cobaugh, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

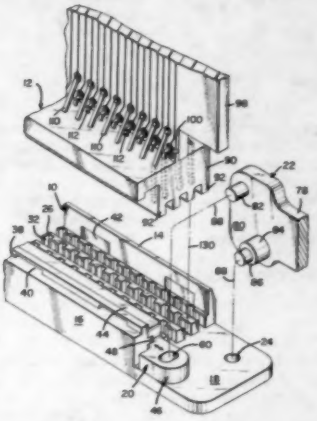
Filed Sep. 8, 1981, Ser. No. 300,333
Int. Cl.³ H01R 13/029
U.S. Cl. 339—75 MP 2 Claims

1. A connector system for electrically connecting a circuit card to a circuit board, comprising:

a. an elongated lower member made from insulating material and having a plurality of spaced apart passages extending vertically therethrough, said passages being arranged in a line running lengthwise of the lower member;

b. a plurality of conductive contact elements positioned in the passages with the elements having an upper contact surface extending above the top surface of the lower member and a lower end extending below said member for insertion into a printed circuit board for making electrical contact with conductive traces thereon;

c. an elongated upper member made from insulating material and having an elongated rib depending from and extending lengthwise of the underside thereof with the rib having a plurality of spaced apart lateral openings along one side, further said member having a plurality of passages extending vertically therethrough and into the rib intersecting the lateral openings therein, said upper member further having means on the upper surface thereof for securing a circuit card thereto with the card being on an edge and parallel to the passages, said upper member being received onto the top surface of the lower member



with the lateral openings being in registration with the upper contact surfaces;

d. a plurality of conductive contact elements positioned in the passages in the upper member and having card engaging contact surfaces extending above the top surface thereof for engaging conductive traces on a card which may be positioned thereon and further having lower contact surfaces positioned in the lateral openings in the rib;

e. camming means mounted on the lower member for moving the upper member laterally on the top surface of the lower member whereupon the

upper contact surfaces are received in the lateral openings to engage and electrically contact the lower contact surfaces positioned therein.

4,392,706

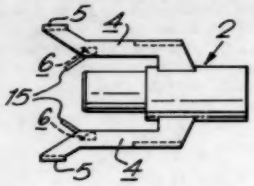
ELECTRICAL CONNECTOR WITH LATCHING MEANS

Robert W. Baker, Kenton; Leonard J. Owen, Watford, and Reginald J. Simmons, South Harrow, all of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 23, 1981, Ser. No. 256,650
Claims priority, application United Kingdom, May 2, 1980, 8014610; Oct. 7, 1980, 8032282
Int. Cl.³ H01R 13/629
U.S. Cl. 339—91 R 7 Claims

1. An electrical connector assembly comprising two housing parts each containing one or more terminals, the housing parts and terminals being such that the housing parts can be mated thereby to mate the terminals contained therein, the housing parts having interengaging latching members which provide a force which assists in mating of the two housing parts, and which serve to secure the housing parts together in their mated condition, the latching members comprising on one housing

part a ramp or ramps on each of two opposite sides of the housing part, and on the other housing part a resilient cantilever arm on each of two opposite sides of said other housing part, each arm carrying a projection adapted and arranged to ride over a ramp on the one housing part as the two housing parts are mated, the ramps on the one housing part and the projections on the arms of the other housing part having cooperating surfaces which engage when the housing parts are fully mated, to prevent unmating of the housing parts, in which the



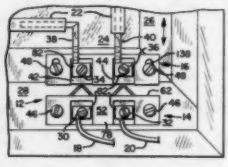
ramps are supported on the one housing part such that deflection of the arms of the other housing part towards the one housing part when the housing parts are mated disengages the cooperating surfaces of the ramps and projections and enables the housing parts to be unmated without further deformation of the arms, with the projections on the arms of the other housing part passing under the ramps on the one housing part, whereby the projections offer no resistance to unmating of the housing parts.

4,392,707

TAKE-OFF CONNECTOR FOR SECURITY CIRCUIT

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed May 18, 1981, Ser. No. 264,572
Int. Cl.³ H01R *13/54;* **G08B** *13/08*
U.S. Cl. 339—125 R **8 Claims**



1. A take-off connector for use in a security system electrical circuit for connecting a stationary conductor of said security system circuit with a conductor of said circuit which is carried on a movable object such as a slidable window and the like, said take-off connector comprising:

(a) a contact carrying member having at least two mutually perpendicular sides and a third side and defining a plurality of recesses located in one of said mutually perpendicular sides for receiving the respective ones of a plurality of fixed contacts, said contact carrying member including a contact mounting element defining a contact attachment aperture;

(b) a plurality of fixed contacts located spaced apart from one another on said contact carrying member, each of said fixed contacts including a contact surface associated with and located substantially flush with at least two of said mutually perpendicular sides of said contact carrying member and each of said fixed contacts comprising an elongate strip of conductive material including a plurality of inwardly directed angles defining a plurality of interconnected segments including said contact surfaces, a pair of said segments being arranged to fit on opposite sides of said contact mounting element and each segment of said pair including aperture means for receiving a terminal post screw;

(c) first terminal means located on each of said fixed contacts for electrically connecting a conductor of said security system electrical circuit directly thereto, said first terminal means being located on said third side of said contact carrying member;

(d) means for mounting said contact carrying member on a mounting surface, alternatively with said third side extending away from said mounting surface or with said third side spaced apart from said mounting surface;

(e) a contact housing including a first side thereof and defining a plurality of contact exposing apertures located on said first side thereof in spaced apart relationship;

(f) means for mounting said contact housing on a surface;

(g) a plurality of bifurcated spring contacts each including a pair of resiliently flexible convexly arcuate contact points, each contact point having a generally "U"-shaped portion and a free end, said free end being located within said contact housing;

(h) supporting means, included in said contact housing, for holding each said bifurcated spring contact with said "U"-shaped portion of each contact point protruding outwardly from said housing through a respective one of said contact exposing apertures to contact a respective one of said contact surfaces; and

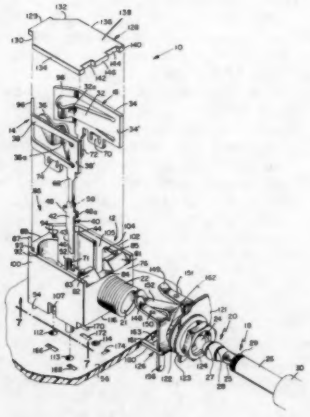
(i) second terminal means located on each said bifurcated spring contact for electrically connecting a conductor of said security system electrical circuit directly thereto.

4,392,708

ELECTRICAL JACK

James R. Bailey, Chicago, and Kurt Lutzenberger, Arlington Heights, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Aug. 4, 1980, Ser. No. 174,788
Int. Cl.³ H01R *13/50, 17/18*
U.S. Cl. 339—182 R **6 Claims**



1. An electrical jack, comprising:

(a) a housing of insulating material having integral walls, including a front wall, forming a cavity, said front wall having an axially extending dielectric collar member with a passageway for guiding a stem of a jack plug into said cavity;

(b) at least one spring contact electrode disposed within said housing cavity adapted to engage a portion of the jack plug stem when such stem is inserted into the cavity to

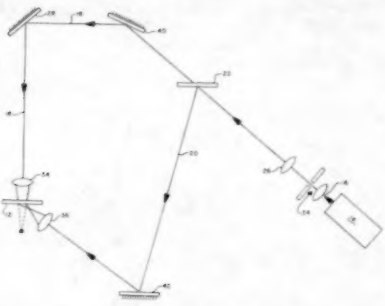
establish electrical contact between such electrode and such portion of the jack plug; and

(c) an electrical contactor electrode having an aperture formed in a mounting portion thereof disposed around the dielectric collar member outside the housing and having a finger electrode protruding across the front wall of the housing into the cavity to electrically contact a different portion of the jack plug.

4,392,709
METHOD OF MANUFACTURING HOLOGRAPHIC ELEMENTS FOR FIBER AND INTEGRATED OPTIC SYSTEMS

Joseph L. Horner, Cambridge, and Jacques E. Ludman, Westford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 29, 1980, Ser. No. 201,860
Int. Cl.³ G03H *1/04*
U.S. Cl. 350—3.83 1 Claim



1. An improved method of manufacturing a reflective holographic element for fiber and integrated optic systems in order to substantially eliminate speckle pattern problems, comprising the steps of:

(a) providing a photosensitive medium of sufficient thickness to achieve a high diffraction efficiency of approximately 80% and a broad bandwidth of operation of approximately ±15% about a central wavelength;

(b) providing a spatially and temporally coherent beam of electromagnetic radiation adjacent said photosensitive medium;

(c) dividing said beam of electromagnetic radiation into a first beam following a first path of preselected length and a second beam following a second path of preselected length;

(d) placing reflecting elements in at least one of said paths in order to make said predetermined lengths of said first path and said second path substantially equal;

(e) optically aligning said first beam path and said second beam path so that said first beam and said second beam impinge with each other on opposite sides of said photosensitive medium and interfere therein;

(f) placing a lens within each of said first and said second beam paths adjacent said photosensitive medium in order to form a spherically converging wavefront within said first beam path and a spherically diverging wavefront within said second beam path;

(g) maintaining an angular relationship between said diverging beam and said converging beam so as to produce low reflection losses while obtaining substantially high dispersion throughout the interference region within said photosensitive medium;

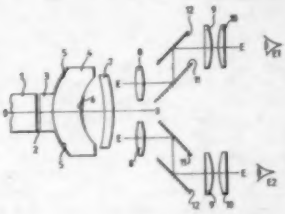
(h) maintaining identical polarization in said first and said second beams; and

(i) processing said photosensitive medium in order to form said holographic element having said broad bandwidth of operation.

4,392,710
OPTICAL APPARATUS

Philip J. Rogers, Clwyd, Wales, assignor to Pilkington P. E. Limited, England

Filed Nov. 5, 1980, Ser. No. 204,160
Claims priority, application United Kingdom, Nov. 22, 1979, 7940482
Int. Cl.³ G02B *23/02*
U.S. Cl. 350—505 32 Claims

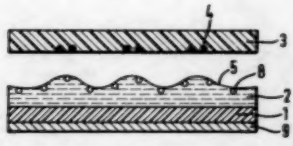


1. Optical apparatus for providing both eyes of an observer with a view of a single object comprising a catadioptric lens system and a pair of telescopes for viewing the image produced by that system, each of said telescopes comprising optical elements spaced from each other and from the catadioptric lens system by a medium which is neither solid nor liquid, there being means to fold the light path through each telescope so as to provide an exit pupil separation that is adequate for normal two eye viewing.

4,392,711
PROCESS AND APPARATUS FOR RENDERING VISIBLE CHARGE IMAGES

Roland Moraw, and Günther Schädlich, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 245,720
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012253
Int. Cl.³ G02F *1/29*
U.S. Cl. 350—361 11 Claims

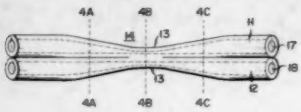


1. A process for rendering visible an electrostatic charge image by deforming the surface of a liquid having a resistivity of between 10^6 and 10^{16} ohm-cm and a polarizability of between about $5 \cdot 10^{-24}$ and $20 \cdot 10^{-24}$ cm^3 and being present in a thickness of 10 to 100 μm on one of a metallic and dielectric support into a reversible, optically readable relief image, comprising the steps of positioning the electrostatic charge image producing the relief image—during the period in which the charge image is made visible—at a distance of about 10 to 1,000 μm from the surface of the liquid without contacting said liquid.

4,392,712
LIGHT DISTRIBUTOR

Takeshi Ozeki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

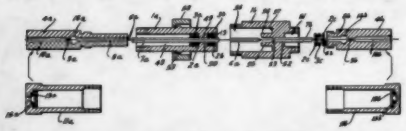
Continuation of Ser. No. 888,358, Mar. 20, 1978, abandoned.
This application Oct. 29, 1980, Ser. No. 201,987
Claims priority, application Japan, Mar. 23, 1977, 52-31032; Apr. 8, 1977, 52-39552
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.16 7 Claims



1. A light distibutor comprising a plurality of optical fibers with each of said optical fibers having a core located therein that is encapsulated by an individual cladding; said light distributor having a tapered light mixing section in which the cladding of adjacent optical fibers remain intact when said optical fibers, held firmly together in a juxtapositional relationship, are thermally fused together to form said tapered light mixing section, said optical fibers being subjected to tensile stresses during said thermal fusion; said optical fibers being thermally fused only in the region of said tapered light mixing section; whereby a light distributor is formed which distributes optical signals with a small loss of input optical energy.

4,392,713
ARRANGEMENT FOR ALIGNEDLY COUPLING TWO COATED LIGHT-CONDUCTIVE FIBERS

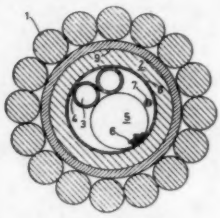
Hans Piter, Cologne, and Klaus Serapins, Berg. Gladbach-Refrath, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 890,192, Mar. 27, 1978, Pat. No. 4,223,979.
This application Oct. 29, 1979, Ser. No. 89,107
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714327; Apr. 13, 1977, 2716222
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 14 Claims

1. An apparatus for aligning and coupling two coated light-conductive fibers, comprising a first guide member having a channel to support a first fiber to be coupled to a second fiber, a second guide member having a channel to support an end of the second fiber, said channel including a first section of a relatively large diameter, an intermediate section of a relatively small diameter to receive a stripped end portion of the second fiber and a third section coordinated to the diameter of the coated light-conductive second fiber; at least three clamping rods inserted into a space provided in said first guide member and partially extending into said first section of said second guide member, said clamping rods being arranged to engage the abutted stripped end portions of said fibers; a protective socket surrounding said second guide member and having an opening at one end thereof to receive said second coated light-conductive fiber, said protective socket having a recess communicating with said opening and a resilient O-ring inserted into said recess to yieldably engage said second coated light-conductive fiber when it is inserted into said third section of the channel formed in the second guide member; and deflectable means encompassing said clamping rods to maintain said clamping rods in clamping contact with said stripped end portions, said deflectable means being positioned on said clamping rods substantially at the middle thereof, said second guide member being connected to the first guide member and arranged to connect the channel formed in the first guide member to the channel formed in the second guide member thereby providing radial forces for pressing said deflectable means inwardly into contact with said clamping rods to hold said stripped end portions in aligned and abutting position.

4,392,714
OVERHEAD POWER CABLE HAVING LIGHT CONDUCTING FIBERS ARRANGED IN ITS INTERIOR

Siegfried Brüggendieck, Radevormwald; Karl-Heinz Nolting, Cologne; Friedrich Krahn, and Gerhard Olejak, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,347
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015732
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.23 2 Claims



1. An overhead power cable for simultaneously transmitting electrical energy and data signals, said cable comprising:
- at least two light-conducting fibers, each fiber being provided with a mantle of synthetic resin;
- at least one strength member, said light-conducting fibers being stranded with or around the strength member to produce a core having a strand length and strand diameter, the strand length being from 5 to 15 times the strand diameter;
- a band of synthetic resin provided around the core;
- a sheath of synthetic resin provided around the band of synthetic resin;
- a seamless metal sheath provided around the sheath of synthetic resin; and
- at least one layer of electrically conductive wires provided around the seamless metal sheath.

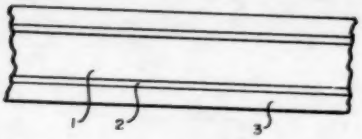
4,392,715
OPTICAL FIBER

Hans-Ulrich Bonewitz, Hammersbach; Albert Muhlich, Frankfurt, and Karlheinz Rau, Hanau, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,088
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2907650
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.33 11 Claims

1. In an optical fiber having a core consisting essentially of vitreous silica, said core having jacket of plastic which is optically effective at least on a length of 10 m reckoned from the light input end of the fiber and which has a refractive index n_M which is smaller than that of the core, the improvement

wherein said core consists essentially of an inner portion and an outer portion, which are integral with one another and differ with respect of their refractive indices, said outer portion consisting essentially of vitreous silica having a refractive index n_{ext} which is smaller than the refractive index n_K of the remaining inner portion but greater than the refractive index



n_M of said jacket, said vitreous silica of said core consisting essentially of synthetic vitreous silica made from silicon halides, the OH-content of said synthetic vitreous silica amounting to less than 10 ppm, and wherein n_{ext} lies in the range from $n_K-(n_K-n_M)\cdot(0.25 \text{ to } 0.8)$, the thickness of said outer portion amounts between 0.8 μm to 8 μm and the thickness of said inner portion is greater than the thickness of said outer portion.

4,392,716

MECHANISM TO MAINTAIN CONSTANT BODY TUBE LENGTH OF BINOCULAR MICROSCOPE

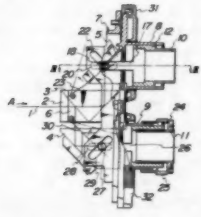
Tsutomu Shimizu, Hanno, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,219

Claims priority, application Japan, Apr. 22, 1980, 55-53894[U]

Int. Cl.³ G02B 21/20, 27/10

U.S. Cl. 350—145 **5 Claims**



1. A mechanism to maintain a constant body tube length of a binocular microscope having a casing with two outer frames mounted thereon in a slidable manner in a width direction of the microscope, two ocular sleeves carried by said outer frames in a manner slidable in an axial direction thereof, oppositely slanted linear cam grooves bored on said casing with angles of 45° relative to said axial direction, and pins connected to said ocular sleeves and fitted in said linear cam grooves respectively, said ocular sleeves being adapted to slide axially relative to the outer frames in response to symmetrical widthwise sliding of said outer frames relative to the casing so as to maintain said body tube length constant; said mechanism comprising slots bored through said outer frames so as to extend in the axial direction thereof and to slidably receive said pins connected to said ocular sleeves, and resilient means disposed between said casing and said ocular sleeves so as to apply axial forces to said two ocular sleeves in opposite directions.

4,392,717

LIQUID CRYSTAL DISPLAY DEVICE

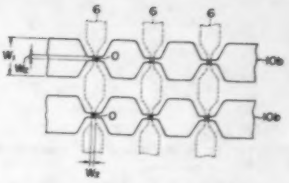
Yoshimichi Shibuya, and Masami Takahashi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1981, Ser. No. 223,289

Claims priority, application Japan, Jan. 23, 1980, 55-5673

Int. Cl.³ G02F 1/13

U.S. Cl. 350—334 **4 Claims**



1. A liquid crystal display device comprising a pair of opposing upper and lower substrates having a liquid crystal filled therebetween and coupled to each other through an electrically insulative sealing material at the peripheral portions thereof, said upper and lower substrates being provided with upper and lower electrode patterns including wiring conductors on respective surfaces facing oppositely to each other, the wiring conductors of said upper and lower electrode patterns having cross-over portions which overlap each other between said upper and lower substrates, wherein at least a part of the cross-over portions of the wiring conductors of said upper and lower electrode patterns is disposed within an effective display region of said liquid crystal display device enclosed by said sealing material, and each of the cross-over portions of the wiring conductors of said upper and lower electrode patterns disposed within said effective display region has a width smaller than that of the remaining portion of the respective wiring conductors.

4,392,718

RESISTIVE ELECTRODE LCD AND VOLTAGE SUPPLY MEANS

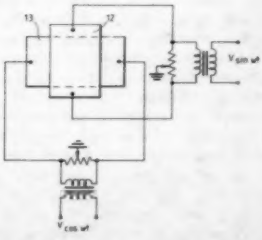
John M. Morrison, Edinburgh, Scotland, assignor to Ferranti Limited (now Ferranti plc), Cheadle, England

Filed Dec. 30, 1980, Ser. No. 221,499

Claims priority, application United Kingdom, Jan. 12, 1980, 8001093

Int. Cl.³ G02F 1/13

U.S. Cl. 350—336 **6 Claims**



1. A display device which includes a pair of spaced electrodes each having a resistance characteristic such that a potential gradient may be developed across the electrode, a pair of terminals on each electrode located such that the potential gradients developed across the two electrodes extend at an angle to one another, a liquid crystal material located between the two electrodes and being of a type which becomes opaque when an electric field is applied across it, voltage supply means

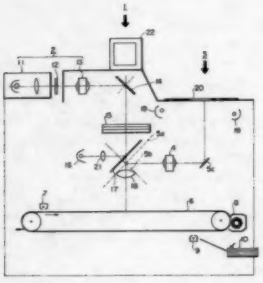
operable to apply an alternating potential across each pair of terminals, such that the two potentials are of the same frequency and are out of phase with one another by an angle which determines the form of the display and in which the voltage supply means are arranged to provide, across each electrode, a constant voltage and include means for varying the potential of each terminal with respect to a reference potential.

4,392,719

IMAGE FORMING METHOD AND APPARATUS

Sohichi Sekimoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1980, Ser. No. 169,079
Claims priority, application Japan, Jul. 19, 1979, 54-91005
Int. Cl.³ G02F 1/13
U.S. Cl. 350—342 2 Claims



1. A system for forming an image onto a photosensitive recording medium comprising:

a memory liquid crystal cell having a layer of nematic-cholesteric phase transition type memory liquid crystals, a photoconductive layer disposed adjacent said memory liquid crystal layer, and transparent electrodes sandwiching said memory liquid crystal layer and said photoconductive layer;

means for projecting an optical image onto said memory liquid crystal cell comprising first means to project a positive original optical image on said memory liquid crystal cell for recording as a latent image and second means for projecting a negative original optical image either onto said memory liquid crystal cell as a latent image or onto said photosensitive recording medium without forming a latent image;

means for applying a predetermined voltage to said memory liquid crystal cell to determine the polarity of an image recorded thereon; wherein said means for applying a predetermined voltage comprises, a voltage source and circuit means for applying a bias voltage from said source having a polarity determined by whether the original image is a positive or negative original optical image

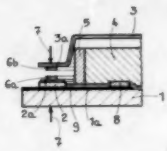
means for projecting an optical image from said memory liquid crystal cell to said photosensitive recording medium comprising a light source, a first lens, a half-silvered mirror positioned to direct light from said light source focused through said first lens onto the surface of said memory liquid crystal cell, and a second lens receiving light transmitted through said half-silvered mirror and focusing it onto said photosensitive recording medium.

4,392,720

ELECTROCHROMIC DISPLAY CELL

Claude Ganguillet, Neuchatel; Yves Ruedin, Saint-Blaise, and Michel Sallin, Neuchatel, all of Switzerland, assignors to Ebauches, S.A., Canton of Neuchate, Switzerland

Filed Nov. 28, 1980, Ser. No. 211,203
Claims priority, application Switzerland, Dec. 17, 1979, 11182/79
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 2 Claims



1. An electrochromic display cell comprising a substantially flat substrate, an electrode disposed on said substrate, an electrochromic material disposed on a portion of said electrode, a cover having a substantially flat peripheral portion, an ionic conductor disposed between said substrate and said cover, annular soldering means for sealing said peripheral portion of said cover to said substrate, and a protective frame disposed in tight contact with said substrate and said cover and disposed tightly separating said soldering means and said ionic conductor in order to prevent chemical reaction therebetween.

4,392,721

ELECTROCHROMIC CELL HAVING A MIXED SOLID ION-CONDUCTING LAYER

Robert D. Giglia, Rye, N.Y., and Gottfried Haacke, New Canaan, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 19, 1981, Ser. No. 235,871
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 3 Claims

1. An electrochromic device comprising a layer of inorganic electrochromic material having one of its surfaces in ion-conductive contact with a surface of a single ion-conductive insulating layer which consists essentially of a codeposited mixture of SiO and Cr_2O_3, with those two layers disposed between two electrode surfaces with means for passing electric current in reversible directions through the two layers for alternate coloration and erasing of the electrochromic layer wherein the ratio of Cr_2O_3 to SiO in said codeposited mixture is the equivalent of a ratio in the range from 2.5 to 50 mμ film thickness of Cr_2O_3 to 160 mμ film thickness of SiO.

4,392,722

PRISM POLARIZER

Masataka Shirasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 8, 1981, Ser. No. 261,877
Claims priority, application Japan, May 9, 1980, 55-63659[U]
Int. Cl.³ G02B 5/04; G02F 1/09, 1/29
U.S. Cl. 350—375 16 Claims

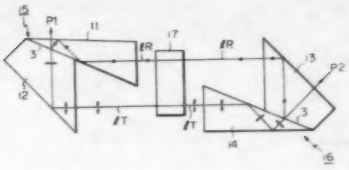
1. A prism polarizer for separating an incident light beam having P-polarization and S-polarization light rays, comprising:

a pair of anisotropic crystal prisms, wherein each prism has a boundary surface, the boundary surface of a first prism of said pair faced to the boundary surface of the second prism, thus defining a facing plane;

wherein each comprises a crystal which has an optical axis and an optical characteristic such that the difference between the square of the refractive index for light rays

having a polarization plane parallel to the optical axis, and the square of the refractive index for light rays having a polarization plane perpendicular to the optical axis, is larger than 1;

the angle of incidence of a beam, exiting one of said prisms, upon the boundary surface of said beam-exiting prism being equal to the Brewster angle for the refractive index for the P-polarization rays,



so that the P-polarization rays are transmitted through said boundary surface of said beam-exiting prism, while the S-polarization rays are totally reflected at said boundary surface of said beam-exiting prism, thereby said incident beam being separated into two polarized beams, and

wherein each prism is formed so that each of said two separated polarized beams is totally reflected within each respective prism and the separated polarized beams exit said respective prisms parallel with each other.

4,392,723

AIMING DEVICE

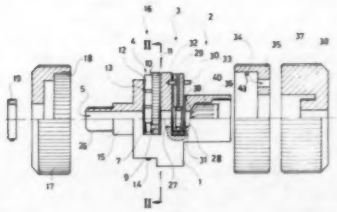
Walter Gehmann, Karlstrasse 40, Karlsruhe, Fed. Rep. of Germany 7500

Filed Jan. 23, 1981, Ser. No. 227,606

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004635

Int. Cl.³ F41G *1/14*

U.S. Cl. 350—407 **7 Claims**



1. An aiming device comprising: a tubular support housing; an adjustable iris diaphragm arranged in said housing at one end thereof and forming an eyepiece, said diaphragm consisting of an axially slotted sleeve forming ribs which are bent inwardly at their free ends, said inwardly bent free ends overlaying each other scale-like and being received in a conical opening in said housing; a rotatable operating ring threaded onto said housing and engaging said slotted sleeve for axially forcing said sleeve with its free ends into said conical opening for causing inward deflection of said free ends for adjustment of the opening of said eyepiece; a polarizing filter structure also mounted in said housing and consisting of two adjacent polarizing discs rotatably mounted relative to each other by 90°, each being supported on an operating lever, the first one being linked to said housing, and a polarizing filter control ring rotatably supported on said housing and having the end of the second polarizing filter operating level linked thereto for rotating said polarizing filters relative to each other, said filter control ring further having means for engaging the first operating lever for pivoting said lever to move the filters out of line of sight of said aiming device and a color filter disc including a number of different color filters and provided with external gearing and an operating ring mounted rotatably around said housing and provided with internal gearing in engagement with the gearing of said filter disc, and said filter disc being rotatably supported by rollers disposed in an area opposite the area of engagement of said gearings so as to permit operation thereof, all three rotatable operating rings, the color filter disc operating ring, the polarizing filter support lever operating ring and the iris diaphragm operating ring being disposed axially closely adjacent one another and rotatably around said housing.

4,392,724

LENS SYSTEM CAPABLE OF SHORT DISTANCE PHOTOGRAPHY

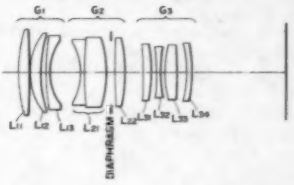
Yoshinari Hamanishi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 19, 1981, Ser. No. 226,011

Claims priority, application Japan, Jan. 31, 1980, 55/10704

Int. Cl.³ G02B *9/64, 15/14*

U.S. Cl. 350—163 **10 Claims**



1. A lens system capable of continuously effecting infinity photography to high magnification proximity photography, comprising:

a convergent lens group which is a first group positioned most adjacent to the object side;

a convergent lens group which is a second group positioned rearwardly of said first group;

a divergent lens group which is a third group positioned rearwardly of said second group; and

a diaphragm provided between said first group and said third group;

said first group and said second group being movable toward the object side relative to said third group while enlarging the spacing between said first and second groups when focusing is effected from infinity to a short distance, and the diaphragm being movable with the second group.

4,392,725

DEVICE FOR BLIND SPOT DELINEATION

Larry A. Sheingorn, 3139 Tennyson St., NW., Washington, D.C. 20015

Continuation-in-part of Ser. No. 966,793, Dec. 5, 1978, abandoned. This application Feb. 25, 1980, Ser. No. 124,101

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—224 **4 Claims**

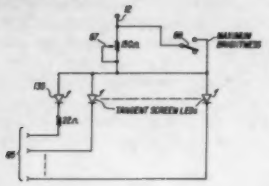
1. A self-contained, solid state device, with no moving parts, that determines visual field defects, comprising:

(a) a surface with lamps mounted therein connected to circuitry which automatically turns on the lamps during testing,

(b) a spring return push button switch that the patient depresses upon observing a lighted lamp on said surface connected to circuitry which determines when the patient responds to or does not respond to a lighted lamp and stores the information in memory,

(c) circuitry which reads and processes the stored information connected to circuitry which routes the output when

the memory is read to lamps corresponding to the lamps which were presented to the patient, and not responded to by the patient,



(d) circuitry which determines when the test is complete and

(e) a power supply which supplies power to drive the circuitry of the device.

4,392,726

AUTOMATIC FOCUS CONTROL SYSTEM FOR VIDEO CAMERA WITH IMPROVED POSITION DETECTING APPARATUS

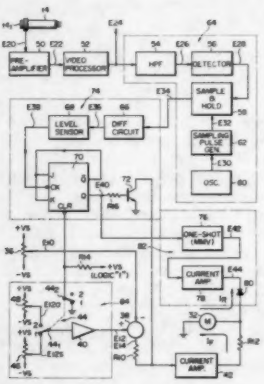
Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1981, Ser. No. 262,918

Claims priority, application Japan, Jun. 13, 1980, 55-79742

Int. Cl.³ G03B 7/08

U.S. Cl. 354—25 **17 Claims**



1. A focus control apparatus adapted to a camera including a lens system, image pickup means for providing a video signal disposed on the optical axis of the lens system, and moving means for varying a relative distance between a light receiving surface of the image pickup means and the lens system so that an object is focussed onto the light receiving surface, said relative distance being varied in a first direction or a second direction which is opposite to said first direction, comprising:

first means coupled to said image pickup means including means for providing a detection signal which includes higher frequency components of the video signal provided by said image pickup means; and means for varying the level of said detection signal according to said relative distance between said light receiving surface and said lens system;

second means coupled to said first means and to said moving means for fixing said relative distance when said detection signal substantially takes an extreme value; and

third means coupled to said second means and to said moving means for causing a predetermined amount of the relative distance variation in said second direction when the relative distance variation is effected in said first direction and when the relative distance variation in said first direction exceeds by said predetermined amount a point at which said detection signal takes said extreme value;

said third means including activating means coupled to said moving means for actuating said moving means during a given predetermined period of time which corresponds to said predetermined amount of said relative distance variation in said second direction.

4,392,727

CAMERA EXPOSURE CONTROL DEVICES WITH SMOOTHING CIRCUIT

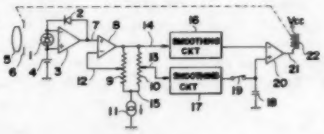
Masayoshi Sahara, Sennan; Masaaki Nakai, Nara; Tokuji Ishida, Daito, and Hiroshi Hosomizu, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 10, 1981, Ser. No. 301,096

Claims priority, application Japan, Sep. 20, 1980, 55-131099

Int. Cl.³ G03B 7/085, 7/089

U.S. Cl. 354—43 **5 Claims**



1. A camera exposure control circuit, comprising:

a photoelectric circuit including a photoelectric element to receive light from an object to be photographed through the camera diaphragm aperture for generating a voltage output as a function of a brightness of an object to be photographed;

a control circuit for controlling the camera exposure in accordance with said voltage output including a comparison circuit for comparing said voltage output, at the time when the diaphragm aperture is being stopped-down, with a given voltage level, and providing an inverted output when said voltage output attains a specified relationship with said given voltage level, and further including means for stopping the stopping-down operation of the diaphragm in response to said inverted output; and

a smoothing circuit connected between said photoelectric circuit and said control circuit and having a smaller charging time constant than the discharging time constant thereof.

4,392,728

CAMERA WITH FOCAL-PLANE SHUTTER HAVING CONTRAST CONTROL

Muneaki Yoshida, No. 2635, Kawaguchi Cho, Hachioji City, Tokyo, Japan

Continuation of Ser. No. 1,619, Jan. 8, 1979, abandoned. This application May 26, 1982, Ser. No. 381,944

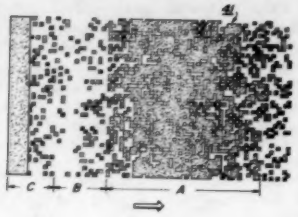
Claims priority, application Japan, Jan. 11, 1978, 53-1653

Int. Cl.³ G03B 7/08

U.S. Cl. 354—49 **7 Claims**

1. In a camera comprising a focal-plane shutter having a front curtain and a rear curtain for measuring reflected light from the front curtain surface to determine a proper exposure, the improvement wherein the front curtain has a center portion thereof formed into a low reflection portion for measuring reflected light with the start of the front curtain and a rear end portion being at least formed into a high reflection portion as

compared with the center portion in the running direction of the front curtain means for delaying, running of said rear



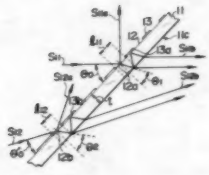
curtain until the measured light reaches a predetermined integral value to control contrast.

4,392,729

MOVABLE REFLECTING MIRROR FOR SINGLE LENS REFLEX CAMERA

Katsuhiko Tsunefuji, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Oct. 19, 1981, Ser. No. 312,826
Claims priority, application Japan, Nov. 18, 1980, 55-165833[U]
Int. Cl.³ G03B 19/12; G02B 27/14
U.S. Cl. 354—152 8 Claims



1. A camera comprising:

(A) picture-taking optics including a lens for transmitting picture-taking light along and around a first optical axis which is the lens axis and onto a film plane of said camera;

(B) viewfinder optics; and

(C) a mirror movable between a first position wherein said mirror is at an angle with respect to said first optical axis, intercepts picture-taking light transmitted by said picture-taking optics before it reaches said film plane and reflects said picture-taking light toward said viewfinder optics and a second position wherein said mirror is removed from said first optical axis and permits said picture-taking light to reach said film plane, said mirror including:

(1) an optically transmissive member having a front surface and a rear surface which are partially reflective;

(2) reflecting means disposed on said front surface of said member for reflecting substantially all of the picture-taking light incident thereon; and

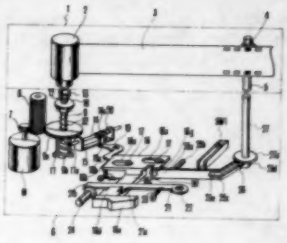
(3) light transmitting openings formed in said reflecting means, the size and spacing of said light transmitting openings being selected such that picture-taking light, which is generally concentrated around the first optical axis by the picture-taking optics, but which also is dispersed around the first optical axis, is transmitted through said openings and some of the transmitted light is reflected by said rear surface of said member while none of that reflected light refracts through said front surface of said member toward said viewfinder optics and the size of the openings is also selected so that diffracting phenomena are avoided.

4,392,730

MOTOR DRIVEN REWIND DEVICE FOR CAMERA

Tomonori Iwashita, Fuchu, and Hidehiko Fukahori, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Nov. 16, 1981, Ser. No. 321,526
Claims priority, application Japan, Nov. 22, 1980, 55-168020[U]; Nov. 25, 1980, 55-165541
Int. Cl.³ G03B 1/12
U.S. Cl. 354—173 8 Claims



1. A motor driven rewind device for a camera comprising:

an electric motor;

switching means, for controlling current supply to said electric motor;

rewind means, driven to move by said motor to rewind a film;

a rewind control member, for changing over said switching means;

a lock member, locking said rewind control member in an initial position and a rewind mode position; and

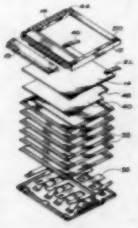
a lock release member, controlling said lock member.

4,392,731

PHOTOGRAPHIC FILM CARTRIDGE ASSEMBLIES WITH REMOVABLE FILTERS

Roger S. Van Heyningen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,575
Int. Cl.³ G03B 17/26
U.S. Cl. 354—180 6 Claims



1. A film cartridge assembly adapted to be received for exposure in cameras of two types, one of said types having a predetermined exposure characteristic and the other of said types having exposure characteristic other than the predetermined exposure characteristics, said cartridge assembly comprising:

a cartridge body;

photographic film in said cartridge body having a photographic characteristic matching the predetermined exposure characteristic of the one camera type;

a filter carried by said cartridge body so as to be in the exposure light path to the film, said filter being adapted to compensate for the non-matching exposure characteristic of the other type of cameras; and

means cooperative only with cameras of said one type of assuring removal of said filter from the light path of such cameras before film in the assembly is exposed by the camera.

4,392,732

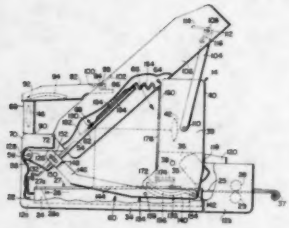
FOLDING CAMERA WITH VIEWFINDER HAVING INDEPENDENTLY MOUNTED OPTICAL ELEMENTS

Donato F. Pizzuti, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1981, Ser. No. 334,980

Int. Cl.³ G03B *17/04, 13/02*

U.S. Cl. 354—187 **7 Claims**



1. A folding camera including a self-erecting and folding viewfinder, said camera comprising:

a base housing section including means for supporting a film unit at a film plane within said base section;

a lens housing section mounting an objective lens and a front viewfinder lens, said lens housing section being pivotally coupled to said base section adjacent one end thereof for movement between an upstanding operative erected position and a folded storage position wherein it is folded back over said base housing section in overlying relation to at least a portion of said film plane;

a mirror assembly including a mirror pivotally coupled to said base section, adjacent an opposite end thereof, for movement between an operative erected position for reflecting image-forming light rays from said lens onto said film plane to expose a film unit thereat and a folded storage position overlying at least a portion of said film plane;

a foldable bellows coupled to said base and lens housing sections and said mirror assembly for movement between an erected position for light shielding the exposure optical path extending between said objective lens, mirror and film plane, and a flat storage position wherein at least a portion of said bellows overlies said film plane;

a cover housing section, having an aperture therein, pivotally coupled to said base section adjacent said opposite end thereof for movement between an erected position providing clearance for said lens housing, mirror assembly and bellows to assume their respective erected positions and a folded storage position overlying said base section and protectively covering said folded lens housing section, mirror assembly and bellows;

first erecting means interconnecting said lens and cover housing sections for coordinated movement between their respective erected and storage positions;

second erecting means interconnecting said lens housing section and said mirror assembly for coordinated movement between their respective erected and storage positions;

a rear viewfinder lens pivotally mounted on said base housing section for movement between an upstanding operative erected position, wherein said rear lens is in optical alignment with said erected front lens to form a viewfinder having a viewing path that extends through said aperture in said erected cover section for viewing and framing a scene in the field of view of said objective lens, and a folded storage position wherein said rear viewfinder lens is folded down in overlying relation to said base housing section; and

third erecting means responsive to movement of said cover housing section from its said storage position to its said erected position for effecting movement of said rear viewfinder lens from its said storage position to its said erected position and also responsive to movement of said cover section from its said erected position to its said storage position for effecting movement of said rear viewfinder lens from its said erected position to its said storage position.

4,392,733

INTERVALS TIMER FOR CAMERAS

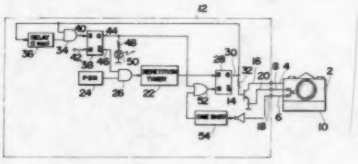
Norio Beppu, Sennan, and Akira Fujii, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1981, Ser. No. 279,950

Claims priority, application Japan, Aug. 7, 1980, 55-93752; Aug. 7, 1980, 55-93753

Int. Cl.³ G03B *17/38, 17/18;* H03K *1/153*

U.S. Cl. 354—266 **7 Claims**



1. Interval timer for periodically providing a camera with a release signal to control the photographing operation thereof by carrying out one exposure cycle and a successive automatic film winding operation in response to each release signal from the interval timer, comprising:

means for periodically producing a release signal;

means for setting the interval between the occurrence of the successive release signals;

first and second terminals to be connected with the camera, the release signal being transmitted to the camera through said first terminal;

means responsive to a first reply signal at said second terminal transmitted from the camera for examining the timing of the arrival of the first reply signal to said second terminal to determine whether or not the examined timing falls into a predetermined condition for controlling the operation of said means for producing, and including means for measuring a period from the transmission of the release signal to the arrival of the first reply signal; and

means responsive to said examining means for interrupting said producing means from producing the release signal when the examined timing falls into the predetermined condition, said predetermined condition being that said measured period is longer than a predetermined time period.

4,392,734

ELECTROPHOTOGRAPHIC CAMERA

John D. Plumadore, Westfield, Mass., assignor to Photon Chroma, Inc., Westfield, Mass.

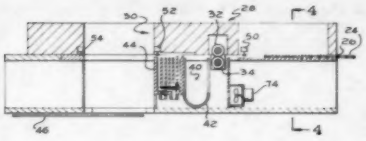
Filed Apr. 28, 1980, Ser. No. 144,782

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—3 R **3 Claims**

1. Camera for making frame-mounted slide transparencies

adapted for projection in a slide projector using electrophotographic film carried on a foldable, planar slide frame, said camera comprising reversible drive means for carrying the frame-mounted film into and out of said camera along a processing track for a single imaging cycle, including an imaging path and a development path, which are co-extensive, but in opposite directions, said imaging path including a corona unit for electrically charging said film while the film is moving thereby and including a corona wire disposed transversely to the path of movement of the film, and an exposure chamber spaced along said imaging path from the corona unit for the imaging of said film, said development path including a toner head disposed between the corona unit and exposure chamber, a means for controlling the operation of said drive means to



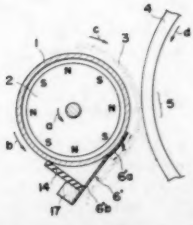
carry the frame-mounted film toward said exposure chamber into registry therewith and for reversing the direction of drive means to withdraw the imaged film along said development path, means for supplying liquid toner to the toner head for developing the imaged film and means for supplying positive air pressure being directed to impinge against the toned surface of the film, said control means including means for sensing positions of the frame during its movement along said track and for selectively energizing the corona unit before imaging and then the toner supply means and air supply means during development of the film after imaging, a bias electrode disposed adjacent said toner head and means for biasing said electrode to a first voltage during pre-exposure passage of said film thereby and to a second substantially lower voltage during passage of said film thereby after exposure within the camera.

4,392,735

MAGNETIC BRUSH DEVELOPING APPARATUS

Tateki Oka, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1981, Ser. No. 265,564
Claims priority, application Japan, Jun. 4, 1980, 55-78414[U]
Int. Cl.³ G03G *15/09*
U.S. Cl. 355—3 DD **3 Claims**



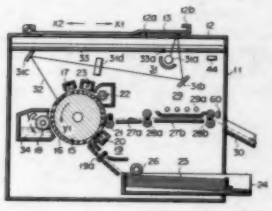
1. A magnetic brush developing apparatus comprising: a developing sleeve rotatably driven in a specified direction; a magnetic roller provided within the developing sleeve and rotatably driven at a high speed in the same direction as the direction of rotation of the developing sleeve for conveying a magnetic developer on the peripheral surface of the developing sleeve in a direction opposite to the direction of rotation of the developing sleeve; and a scraping member of non-magnetic material and having a forward end pressed in contact with the peripheral surface of the developing sleeve for scraping the developer off the peripheral surface of the developing sleeve and having a first guide surface and a second guide surface, the first guide surface being at the forward end portion of the scraping member and having a length of at least 2.0 mm in the direction of transport of the developer and has a cross-sectional shape in the direction of transport of the developer which is in the form of a circular arc having approximately the same curvature as the peripheral surface of said sleeve for conveying the developer along the first guide surface immediately after the developer is scraped off the peripheral surface of the sleeve in a direction parallel to the peripheral surface of the sleeve by the magnetic action due to the rotation of the magnetic roller and at a speed higher than the speed of transport of the developer on the peripheral surface of the sleeve, the second guide surface extending from said first guide surface in a direction away from the peripheral surface of the sleeve for guiding the developer along the first guide surface away from the peripheral surface of the sleeve.

4,392,736

ELECTRONIC COPYING APPARATUS FOR FORMING MULTIPLE IMAGES ON A SINGLE SHEET

Chosin Nakamine, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 21, 1981, Ser. No. 285,522
Claims priority, application Japan, Jul. 22, 1980, 55/99370
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **4 Claims**



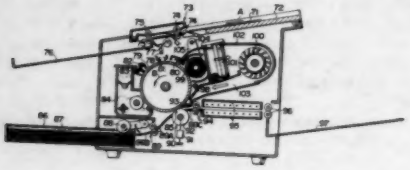
1. An electronic copying apparatus comprising:
document holding means for holding a document to be copied at a given position,
light source means for exposing said document while being held,
scanning means for optically scanning said document by relatively moving said document holding means and said light source means,
latent image forming means which receives light reflected from said scanning means on a rotating photosensitive medium and forms a latent image of said document on said photosensitive medium,
developing means for developing said latent image to form a toner image,
transfer means for transferring said toner image onto a sheet of copy paper, and
fixing means for fixing said toner image transferred onto said copy paper,
wherein said scanning means includes means for scanning said document a plurality of times intermittently; said latent image forming means includes means for forming a plurality of latent images of said document on said photosensitive medium in a continuous manner so that every latent image is displaced on said photosensitive medium for every scanning; and said transferring means includes means for transferring a plurality of said toner images of said document formed on said photosensitive medium onto a single sheet of copy paper.

4,392,737

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 324,098
Claims priority, application Japan, Dec. 2, 1980, 55-169826
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 R 7 Claims



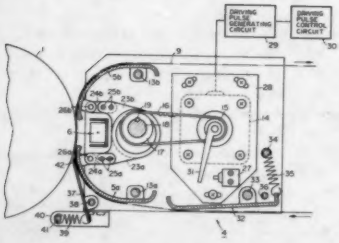
1. An electrophotographic copying apparatus including a photosensitive member which includes a conductive layer carrying a sequential lamination of a first photoconductive layer which is sensitive to visible light and a second photosensitive layer which is sensitive to ultraviolet radiation and serves as an insulator to the visible light, said photosensitive member on which is formed an electrostatic latent image being repeatedly conveyed to a developing station and a transfer station in sequential fashion to produce a plurality of copies with said electrostatic latent image which has been formed thereon, the apparatus characterized by provision of neutralizing means for an irradiation of the conductive layer with visible light and ultraviolet rays to neutralize charge on an area beyond image scope of the photosensitive member, said neutralizing means being disposed upstream of the developing station and downstream of the transfer station, as viewed with regard to a direction of the conveyance of the photosensitive member.

4,392,738

IMAGE TRANSFER DEVICE

Hitoshi Fujino, Yokohama; Masanobu Kanoto, and Hiroo Ichikashi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 89,454, Oct. 30, 1979, abandoned. This application Jan. 25, 1982, Ser. No. 342,367
Claims priority, application Japan, Nov. 10, 1978, 53-138439; Dec. 26, 1978, 53-164148
Int. Cl.[3] G03G *15/14*
U.S. Cl. 355—3 TR 2 Claims



1. An image transfer device for transferring an image from an information recording element, said device comprising:

means for transferring an image from the information recording element to a transfer material, at an image transfer station;

means for feeding the transfer material to said transfer means;

symmetrically arranged transfer material guiding members extending along a transfer material path, each having a first end portion which is remote from said transfer means and a second end portion which is near said transfer means, said first end portion being pivotable to allow the setting, in accordance with the thickness of the transfer material, of the distance between the second end portion and the information recording element at the image transfer station;

driving means, engaged with each of said guiding members adjacent the second end portion thereof, for moving only the second end portions away from the recording element, wherein each guiding member, when said feeding means is not in operation, is away from the information recording element; and

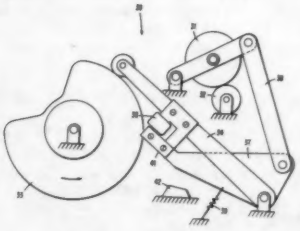
biasing means for applying resilient tension to the transfer material to ensure that the transfer material is spaced apart from the information recording element when said driving means moves said guiding members away from the information recording element.

4,392,739

ELECTROMECHANICALLY OPERATED FUSER ROLL CLOSURE

Leon C. Brown, Boulder County, Colo.; Jesse L. Campbell, Pima County, Ariz.; Uscoe J. Fitts, Fujisawa, Japan, and Willard L. Gudgel, Boulder County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 145,084, Apr. 30, 1980, Pat. No. 4,363,549. This application Mar. 10, 1982, Ser. No. 356,682
Int. Cl.[3] G03G *15/20*
U.S. Cl. 355—3 FU 14 Claims



1. A xerographic toner fixing apparatus comprising:

substantially parallel first and second cylindrical fuser rollers;

biasing means for maintaining the peripheral surfaces of said fuser rollers in an open position;

a rotatable cam;

means for rotating said cam;

means for serially feeding sheets between the peripheral surfaces of said fuser rollers in synchronization with the rotation of said cam, said cam having a contour for maintaining said fuser rollers in a closed position for sheets of a predetermined sheet length; a linkage mechanism coupling said cam to at least one of said fuser rollers, said linkage mechanism including:

an electromechanically operated latch,

an electrical control means for selectively energizing said electromechanically operated latch, and

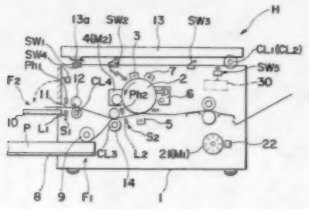
means for shifting the peripheral surfaces of said fuser rollers between open and closed positions when said electromechanically operated latch is energized and for retaining said fuser rollers in an open position when said electromechanically operated latch is deenergized.

4,392,740

PAPER TRANSPORT CONTROL DEVICE FOR USE IN MECHANICAL ARRANGEMENT INCLUDING MANUAL PAPER FEEDING MECHANISM

Masazumi Ito, Toyokawa, and Kenji Shibazaki, Aichi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1981, Ser. No. 254,275
Claims priority, application Japan, Apr. 15, 1980, 55/49829; Feb. 27, 1981, 56/29109
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 SH 8 Claims



1. A paper transport control device comprising:

a paper transport device for transporting paper;

a manual paper feeding mechanism for manually feeding paper into said paper transport device;

a manual paper feed detecting device for detecting the manually fed paper in the vicinity of a manual paper feeding inlet;

an operational start commanding means for starting operations of said manual paper feeding mechanism and said paper transport device in response to detection of a leading edge of said paper by said manual paper feed detecting device;

a paper presence judging means for judging the presence or absence of said paper at a predetermined time at which said paper has been transported in response to operations of said manual paper feeding mechanism but has not yet passed through said manual paper feed detecting device; and

a control means for causing at least one of said operations performed during transport of said paper in said paper transport device to be inoperative if a judgement has been made by said paper presence judging means that said paper is absent.

4,392,741

IMAGE FORMING APPARATUS

Tsuneki Inuzuka, Machida; Koichi Murakami, Tokyo; Kenji Kurita, Mitaka, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

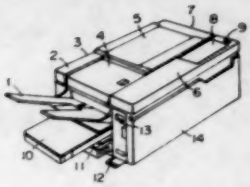
Division of Ser. No. 68,483, Aug. 21, 1979, Pat. No. 4,315,685.
This application Dec. 9, 1981, Ser. No. 329,017
Claims priority, application Japan, Aug. 24, 1978, 53-103044; Aug. 24, 1978, 53-103048; Aug. 24, 1978, 53-103050; Aug. 31, 1978, 53-106736; Sep. 1, 1978, 53-107094
Int. Cl.³ G03G 15/28
U.S. Cl. 355—14 R 7 Claims

1. A copying apparatus comprising: means for forming an image on a copy medium including a movable component,

first detecting means for detecting a first position of the movable component,

first control means for returning the movable component to the first position corresponding to the first detecting means when the component is out of the first position before the copying operation starts,

second detecting means for detecting a second position, different from the first position, after the copying operation is started, and



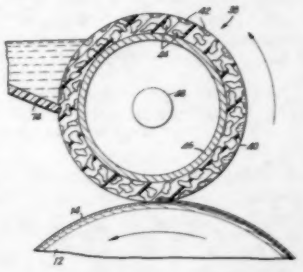
second control means for stopping the copying operation in response to the second detecting means when the component fails to move to the second position.

4,392,742

LIQUID DEVELOPER COPIER CLEANING SYSTEM INCORPORATING RESILIENT CLOSED-CELL CLEANING ROLLER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,324
Int. Cl.³ G03G 21/00, 15/10
U.S. Cl. 355—15 2 Claims



1. Apparatus for removing liquid from a wet surface including in combination a roller comprising a body of resilient material formed with cells over the surface of said roller which are open to the external environment and isolated from the interior of said body, means mounting said roller with the surface of said body in engagement with said wet surface, means for rotating said roller to cause the action of said surface cells to remove liquid from said wet surface, and means remote from said wet surface for deforming said surface cells to force the liquid therefrom, said deforming means having an edge in contact with said roller, said edge having a radius of curvature comparable with the size of said surface cells.

4,392,743

DISC FILM ADVANCE ASSEMBLY

Richard D. Anderson, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

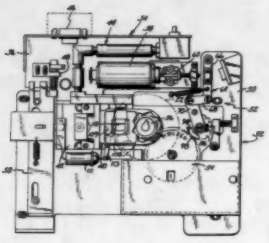
Filed Feb. 18, 1982, Ser. No. 349,926
Int. Cl.³ G03B 27/62
U.S. Cl. 355—75 29 Claims

1. A film advance assembly for use in a photographic printer for advancing a selected film frame of a disc-like film unit on a disc film holder to a print position defined by an optical center at a print gate aperture, the film advance assembly comprising:

a base;

a ratchet wheel rotatably attached to the base and having a plurality of ratchet teeth;

gear train means rotatably attached to the base for rotatably connecting the ratchet wheel with the disc film holder;



means for rotationally indexing the ratchet wheel in a first angular direction to bring the selected film frame to the print position at the print gate aperture; and

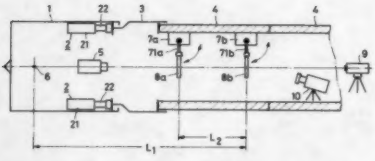
means for engaging the ratchet wheel forcing the ratchet wheel to move in a second angular direction when the film frame has been rotationally indexed past the print position.

4,392,744

METHOD OF AND APPARATUS FOR DETERMINING ANGULAR AND TRANSVERSAL DISPLACEMENTS OF SHIELD MACHINE AND SUCCEEDING PIPE

Tetsuro Tatsuhama, Takarazuka, and Masao Okabe, Sendai, both of Japan, assignors to Okumura Corporation, Osaka, Japan

Filed Mar. 27, 1981, Ser. No. 248,337
Claims priority, application Japan, Oct. 9, 1979, 54/130349
Int. Cl.³ G01B *11/27*; E21C *44/00*
U.S. Cl. 356—153 **4 Claims**



1. A method of determining angular and transversal displacements of a shield machine and a succeeding pipe relative to a predetermined scheduled central axis of a tunnel to be constructed by pipe-jacking tunneling comprising,

(a) providing on the shield machine a first light emitter which emits rearwardly a light beam along the central longitudinal axis of the shielf machine and a reference position on said axis of the shield machine,

(b) projecting said light beam to a pair of targets each having a scale and provided in a succeeding pipe and spaced from each other by a pre-determined distance along the central longitudinal axis of said succeeding pipe to form light spots on the targets,

(c) projecting to said pair of targets a light beam emitted from a second light emitter along said scheduled central axis of the tunnel to be constructed to form further light spots on the targets, said second light emitter being located at the rear portion of the tunnel, and

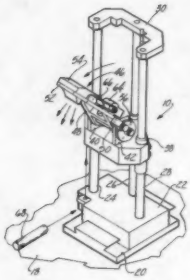
(d) reading said light spots and said further light spots on each targets on the respective scales and measuring a distance from said reference position to one of said targets to determine the angular and transversal displacements of the shield machine and said succeeding pipe relative to said scheduled central axis of the tunnel to be constructed.

4,392,745

TILT HEAD CAMERA FOR INTERFEROMETRIC ANALYSIS OF TIRES

Forrest S. Wright, and Ted R. Zimmerman, both of Rochester, Mich., assignors to Industrial Holographics, Inc., Auburn Heights, Mich.

Filed Apr. 6, 1981, Ser. No. 251,403
Int. Cl.³ G01B *9/25*
U.S. Cl. 356—348 **8 Claims**



1. An interferometric camera comprising, in combination:

a base;

a coherent light source fixedly supported relative to the base;

a housing pivotably supported relative to the base about a pivot axis;

a film support mechanism mounted on the housing; and

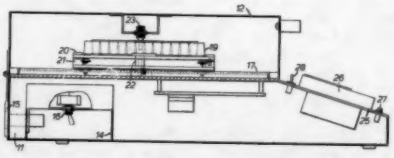
a series of optical elements positioned to receive a beam of light projected by said coherent light source and to direct the beam along the pivot axis of the housing and thence into said housing, at least certain of the optical elements being supported on the housing for pivotal motion therewith, said series of optical elements being operative to direct at least a portion of the light beam outwardly from said housing to illuminate an object to be analyzed, whereby the housing may be positionally adjusted relative to the base along said pivot axis to interferometrically analyze surfaces having a variety of inclinations relative to the housing.

4,392,746

PORTABLE PHOTOMETER

Graham A. W. Rook, London, and Colin H. Cameron, Chatham, both of England, assignors to Portalab Instruments Limited, London, England

Filed Dec. 8, 1980, Ser. No. 214,530
Int. Cl.³ G01N *21/27*
U.S. Cl. 356—409 **5 Claims**



1. A photometer for measuring the transmission properties of a fluid contained in a container having a transparent bottom, said photometer comprising:

a monochromatic light source of a fixed wavelength;

a source of direct current connected to said monochromatic light source;

a collimator assembly for said light source to form a collimated, narrow beam of light;

a moveable tubular member having a base containing said light source and said collimator assembly;

a locating member arranged to contact the top of the container and to thereby locate the end of the tubular member at a predetermined position with respect to the transparent bottom of said container;

a photodetector device positioned beneath said container and arranged to receive said collimated, narrow beam of light.

4,392,747

DISPLAY DEVICE STRUCTURE

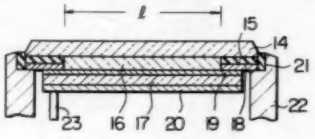
Akio Kumada, Kokubunji; Takahiko Ibochi, Koganei; Makoto Homma, Hamuramachi, and Masashi Tanaka, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1980, Ser. No. 199,976

Claims priority, application Japan, Oct. 24, 1979, 54-136404

Int. Cl.³ G04C *23/02, 21/16*

U.S. Cl. 368—88 **13 Claims**



1. A display device structure comprising an electrically conductive casing; a display panel placed in the casing; a transparent covering and vibrating plate member having its peripheral portion carried on the casing and being on a front side of the display panel; a transparent piezoelectric plate and a pair of transparent electrodes sandwiching the piezoelectric plate, the piezoelectric plate and electrodes being secured to and integral with the covering and vibrating plate member so that mechanical force produced by the piezoelectric plate is effectively transmitted to the plate member, wherein an elastic and electrically conductive member is provided between the peripheral portion of the plate member and the casing; and a double layer including a frame-like blind layer and an electrically conductive frame-like layer, the frame-like blind layer being in contact with the peripheral portion of the plate member and the electrically conductive frame-like layer being in electrical contact with the casing.

4,392,748

QUARTZ CRYSTAL WATCH

Masahito Yoshino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 6, 1980, Ser. No. 204,730

Claims priority, application Japan, Nov. 6, 1979, 54-143580

Int. Cl.³ G04C *23/02;* **G04B** *37/00*

U.S. Cl. 368—88 **28 Claims**

1. A quartz crystal watch comprising:

a movement, said movement including:

vibrator means providing a standard frequency signal;

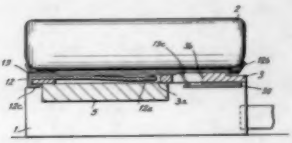
a MOS integrated circuit having electronic circuit means for operating on said standard frequency signal and outputting signals for driving motor means;

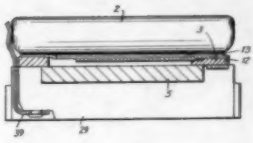
motor means for converting said output signals from said electronic circuit means into mechanical motion, said motor means including a permanent magnet rotor, plate-type stator, and driving coil, said rotor, stator and coil not overlapping one another;

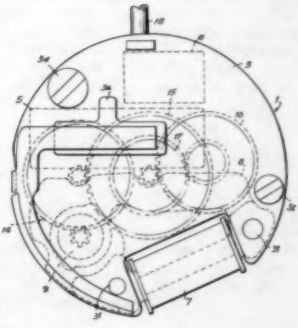
a gear train cooperating with said motor means to drive a display; and

a frame plate supporting said rotor and said gear train, said MOS integrated circuit and said driving coil being positioned in approximately opposite positions on said frameplate, and said gear train being positioned between said MOS integrated circuit and said driving coil;

a battery positioned on one side of said frame plate, the area of said movement being substantially equal to the area of said battery;







an insulating plate positioned between said battery and said one side of said frame plate, said vibrator means, circuit means, motor means and gear train being positioned on the other side of said frame plate, said battery being positioned to overlap said driving coil, said MOS integrated circuit and said gear train; and

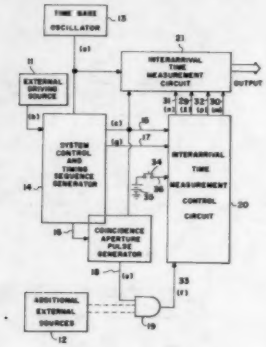
a battery lead plate for connecting said battery with said MOS integrated circuit, at least a part of said lead plate being positioned in contacting opposition with an outer peripery portion of said battery, said battery lead plate supporting said battery relative to said movement and said frame plate.

4,392,749

INSTRUMENT FOR DETERMINING COINCIDENCE AND ELAPSE TIME BETWEEN INDEPENDENT SOURCES OF RANDOM SEQUENTIAL EVENTS

James I. Clemmons, Jr., Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 10, 1981, Ser. No. 282,191
Int. Cl.[3] G04F 8/00; G04B 47/00
U.S. Cl. 368—118 7 Claims



1. An instrument for determining coincidence between a primary external source of pulses and one or more other external sources of pulses comprising:

means receiving said primary external source of pulses for generating a start pulse, a reset pulse and a coincidence aperture pulse each time a primary external source pulse is received;

means receiving said coincidence aperture pulse and the pulses from said other external sources of pulses for producing a coincidence pulse each time a pulse from said other external sources of pulses coincides with said coincidence aperture pulse; and

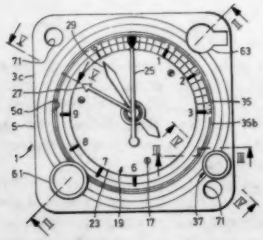
means receiving said start pulses, said reset pulses and said coincidence pulses for measuring the time intervals between coincidences.

4,392,750

CLOCK WITH ROTATABLE RING

Eduard Mettler, Liestal, Switzerland, assignor to Revue Thommen AG, Switzerland

Filed Jan. 26, 1981, Ser. No. 228,390
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 8011102[U]
Int. Cl.[3] G01D 11/28
U.S. Cl. 368—228 18 Claims



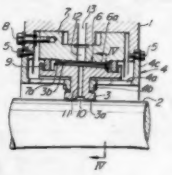
1. A clock comprising, a case, a clockwork mounted in said case having at least one rotatable pointer, a dial face in the case over which said at least one pointer sweeps about an axis, a glass connected to said case and covering said dial face and at least one pointer, at least one illuminator in the case for illuminating the dial face and at least one pointer, and a ring with a face carrying at least one marking rotatably mounted about the axis of said at least one pointer under said glass, said ring face facing said glass to be illuminated by said illuminator along with said dial face and at least one pointer, said ring face being conically inclined toward the axis and away from said glass.

4,392,751

DAMPED BEARING DEVICE

Michiaki Ida, Chiyodamura; Noriaki Hagiwara, Amimachi; Naoyoshi Yamago, Tamarimura; Masahiro Yoshioka, Sakuramura, and Katsuaki Kikuchi, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,658
Claims priority, application Japan, Jun. 4, 1980, 55/74264
Int. Cl.[3] F16C 27/02, 32/06
U.S. Cl. 384—99 3 Claims



3. In a damped bearing device having a housing, a bearing which supports a rotary shaft, a resilient bearing support by which said bearing is supported on said housing, and a fluid film damper formed between said housing and the outer peripheral surface of said bearing, so that the vibration generated in the bearing and the shaft system is damped by said fluid film damper and by said resilient bearing support,

the improvement comprising means provided in said fluid film damper and adapted for adjusting the damping coefficient thereof, wherein said means for adjusting the damping coefficient of said fluid damper is adapted for variably adjusting both the fluid film gap in said fluid film damper and the area of action of the fluid film of said fluid film damper, and wherein said means for adjusting the damping coefficient of said fluid film damper includes

a bearing having a tapered outer peripheral surface on which the fluid film acts, said tapered outer peripheral surface having recesses formed therein; and

a bearing back-up member having a tapered inner peripheral surface opposing to said tapered outer surface of said bearing, said tapered inner peripheral surface having recesses formed therein, said bearing back-up member being supported in said housing in such a manner as to be able to move in the axial direction and to turn in the circumferential direction.

4,392,752

OIL SEAL FOR BEARINGS OF TURBOCHARGER

Masami Shimizu, Chiba, and Junji Yasunobe, Okuwa, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,700
Claims priority, application Japan, Aug. 19, 1980, 55-117288[U]
Int. Cl.[3] F16C 33/74
U.S. Cl. 384—135 1 Claim

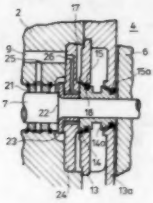
1. In a turbocharger comprising a casing, operating means such as a turbine and a blower within spaced casing parts respectively, a rotary shaft within the casing on the ends of

which the operating means are respectively mounted, spaced bearings for the shaft which are respectively inboard the two operating means, an oil chamber between the bearings, and

an oil seal for preventing leakage of oil from the oil chamber to the casing part of an operating means, comprising

(a). an oil slinger mounted on the shaft between an operating means casing part and the adjacent bearing, and having two axially spaced frusto-conical oil slinger surfaces each of which diverges toward the adjacent bearing and the oil chamber, the diameter of the surface adjacent the bearing being greater than that of the surface adjacent the operating means,

(b). each oil slinger surface having an annular groove,



(c). two seal plates connected to the casing, each of which is aligned with one of the oil slinger surfaces and has an opening surrounding the surface, the surface defining each opening being parallel to and spaced outwardly from the adjacent frusto-conical surface of the oil slinger, thereby forming between each oil slinger surface and the surrounding seal plate a frusto-conical space which diverges toward the adjacent bearing and the oil chamber, and

(d). a seal ring mounted on the frusto-conical surrounding surface of each seal plate and positioned within the annular groove in the adjacent oil slinger surface.

4,392,753

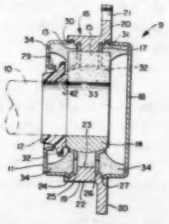
CARTRIDGE BEARING ASSEMBLY

Martin L. Abel, Franklin, Mich., assignor to Permawick Bearing Corporation, Detroit, Mich.

Continuation of Ser. No. 81,614, Oct. 3, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 257,098

Int. Cl.³ F16C *17/02*

U.S. Cl. 384—136 **12 Claims**



1. A bearing assembly for supporting a rotatable shaft to be journaled in the bearing assembly, comprising:

(1) a separate nonporous bearing member made of die cast aluminum alloy having a central bore sized to receive the rotatable shaft in a bearing relationship, said bearing member having a spherical shape and having a radial aperture extending from its central bore to its outer surface;

(2) a mounting member wherein said mounting member has an outer surface which is at least partially cylindrical and an inner surface which is at least partially cylindrical and wherein said mounting member is made of die cast aluminum alloy and has a radially-extending mounting flange;

(3) support means for supporting said bearing member inside said mounting member;

(4) a lubricant-impregnated wicking material, impregnated with aluminum bearing oil, located inside said bearing assembly and in said radial aperture of the bearing member, said portion located in said radial aperture being adapted to contact said rotatable shaft; and,

(5) cap means for retaining said lubricant-impregnated wicking material inside said bearing assembly.

4,392,754

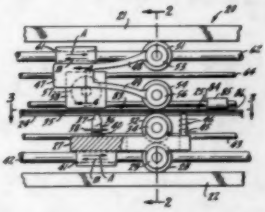
MAGNETIC DOT MATRIX PRINTING METHOD AND APPARATUS

Robert Adler, Northfield, Ill., assignor to Extel Corporation, Northbrook, Ill.

Filed Feb. 10, 1982, Ser. No. 347,716

Int. Cl.³ B41J *3/12, 27/16, 3/16*

U.S. Cl. 400—119 **48 Claims**



1. A method of magnetic dot matrix printing, for printing a character text, character-by-character, on a sheet of non-magnetic paper, comprising the following steps in sequence:

A. positioning a sheet of non-magnetic paper on a platen of erasable permanent magnet material with the platen aligned with a portion of the paper comprising a location for a line of text;

B. moving a magnetic recording head, comprising a plurality of electromagnets having magnetizing poles corresponding to a group of character matrix dots, along a print path transversing the text line location, in closely spaced relation to one platen surface;

C. magnetizing dot-size portions of the platen in accordance with predetermined patterns constituting magnetic images of the characters for a line of text by selectively energizing the electromagnets for limited intervals during step B;

D. developing visible images of the data characters on the paper by applying limited quantities of a magnetic toner to the exposed surface of the paper overlying the platen generally concurrently with formation of the magnetic images in step C; and

E. fixing the visible toner images on the paper.

26. A magnetic dot matrix printer for printing a data character text, character-by-character, on a sheet of non-magnetic paper, comprising:

an elongated strip platen of erasable permanent magnet material;

means for positioning a sheet of non-magnetic paper on one surface of the platen with the platen extending across the paper in alignment with a portion of the paper comprising a location for a line of text;

carriage means reciprocally movable along a print path adjacent the platen, from one end of the text-line location to the other and back again;

magnetic recording head means, mounted on the carriage means and comprising a plurality of electromagnets having magnetizing poles corresponding to a group of character matrix dots disposed in closely spaced proximity to one platen surface, for magnetizing dot-size portions of the

platen in accordance with predetermined patterns constituting magnetic images of the characters for a line of text by selective energization of the electromagnets during movement of the carriage;

magnetic toner dispensing means, mounted on the carriage means, for applying limited quantities of a magnetic toner to the exposed surface of the paper overlying the platen generally concurrently with formation of the aforesaid magnetic images to develop visible images on the paper;

fixing means for fixing the visible toner images on the paper to complete printing of a line of text; and

magnetic erasing means, mounted on the carriage means, for erasing the magnetic images from the platen in preparation for printing a further line of text.

4,392,755

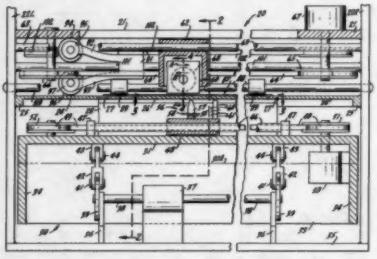
MAGNETIC DOT MATRIX PRINTING

Patricio E. Donoso, Streamwood, Ill., assignor to Extel Corporation, Northbrook, Ill.

Filed Feb. 10, 1982, Ser. No. 347,649

Int. Cl.³ B41J *3/12, 27/16, 3/16*

U.S. Cl. 400—119 **22 Claims**



1. In a method of magnetic dot matrix printing, for printing a character text on a sheet of non-magnetic paper, comprising the following steps in sequence:

A. positioning a sheet of non-magnetic paper on a platen of permanent magnet material with the platen in a predetermined print position;

B. magnetizing dot size portions of the platen in accordance with predetermined patterns constituting magnetic images of the data characters for a line of text; and

C. developing visible images of the characters on the paper by applying limited quantities of a magnetic toner to the exposed surface of the paper overlying the platen;

the improvement comprising the following additional steps:

D. displacing the platen from its print position, away from the paper, in a direction generally transverse to the surface of the paper, through a distance sufficient to preclude substantial magnetic attraction between the magnetic images and the toner comprising the developed visible images;

E. advancing the paper, in a direction substantially parallel to the paper surface, by at least one line space, to move the visible toner images to a fixing position clear of the printing position of the platen after step D; and

F. fixing the visible toner images on the paper at the fixing position.

13. In a magnetic dot matrix printer for printing a character text on a sheet of non-magnetic paper, of the kind comprising:

an elongaged strip platen of permanent magnet material;

means for positioning a sheet of non-magnetic paper on one surface of the platen with the platen extending across the paper in alignment with a portion of the paper comprising a location for a line of text;

magnetic recording means, comprising a plurality of electromagnets having magnetizing poles corresponding to a group of character matrix dots, for magnetizing dot size portions of the platen in accordance with predetermined patterns constituting magnetic images of the characters for a line of text by selective energization of the electromagnets;

magnetic toner dispensing means for applying limited quantities of a magnetic toner to the exposed surface of the paper overlying the platen to develop visible images, corresponding to the magnetic images, on the paper; and

magnetic erasing means for erasing the magnetic images from the platen in preparation for printing a further line of text;

the improvement comprising:

platen displacement means for displacing the platen, in a direction generally transverse to the paper surface, between a print position engaging the paper and an inactive position, the displacement between the two platen positions being sufficient to preclude substantial magnetic attraction between the magnetic images and the visible toner images when the platen is in its inactive position;

line feed means for advancing the paper, in a direction substantially parallel to the paper surface, to move the visible toner images to a fixing position displaced from the platen print position; and

fixing means for fixing the visible toner images on the paper, while at the fixing position, to complete printing of a line of text on the paper.

4,392,756

SERIAL PRINTING APPARATUS

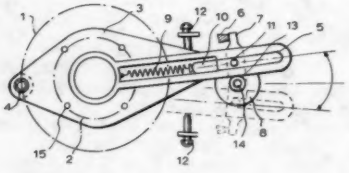
Hyun C. Lee, Seoul, Rep. of Korea, assignor to Gold Star Company, Ltd., Seoul, Rep. of Korea

Filed Dec. 16, 1980, Ser. No. 216,898

Claims priority, application Rep. of Korea, Dec. 31, 1979, 79/7894[U]

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **3 Claims**



1. A printing apparatus comprising:

a printwheel with a hub and spokes extending therefrom, each of said spokes having at least two different types of character slugs thereon;

first drive means attached to the printwheel for rotating said printwheel;

shifting means attached to said first drive means for shifting said printwheel and said first drive means up or down with rotational motion to place a selected character slug at a desired printing position; said shifting means including:

a latchbase having a first and a second end;

a hinge connected to said first end of said latchbase;

a slot positioned in said latchbase near said second end of said latchbase;

a spring having a first and a second end, positioned in said slot, said first end of said spring being attached to one end of said slot;

a movable springbar connected to said second end of said spring; and

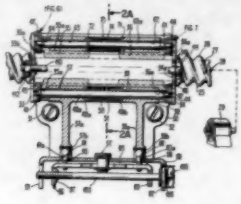
a crank pin positioned in said slot, and attached to said springbar, said crank pin being for driving said latchbase by sliding along said slot; and

second drive means for driving said shifting means.

4,392,757
BACKLASH AND RUNOUT COMPENSATOR FOR LEAD SCREW DRIVES

Clifford M. Denny, Lexington, Ky., and Charles W. Wampler, II, Harrisonburg, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1980, Ser. No. 152,206
Int. Cl.³ B41J *19/20*
U.S. Cl. 400—328 **21 Claims**

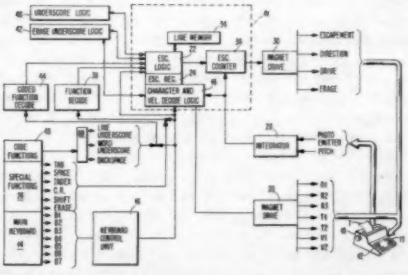


1. Drive apparatus for a work member, said apparatus comprising:
- a lead screw having threads thereon, and motor means for effecting bi-directional rotation of said lead screw;
- first and second laterally spaced apart threaded followers on said lead screw, first biasing means intermediate said threaded followers for biasing said threaded followers against opposite flanks of said threads of said lead screw to thereby inhibit backlash intermediate said followers; and
- second biasing means intermediate said work member and at least one of said followers for effecting coupling between said work member and said followers while controlling backlash therebetween.

4,392,758
UNDERSCORE ERASE

David J. Bowles, Winchester, Ky.; Douglas E. Clancy, Austin, Tex.; Carl F. Johnson, Lexington, Ky., and Danny M. Neal, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 908,314, May 22, 1978, abandoned.
This application Jan. 23, 1981, Ser. No. 227,878
Int. Cl.³ B41J *29/16*
U.S. Cl. 400—697.1 **1 Claim**



1. A method of erasing characters of a width greater than an underscore and said underscore on a typewriter having printing means for selecting and printing proportionally spaced characters of varying widths, said characters including an underscore;
- said printing means operable to print sequentially in response to commands from a keyboard and including means for erasing said characters and underscores;
- said typewriter having electronic controls and proportional escapement capabilities and responsive to electronic commands;
- said method comprising the steps of:
- generating codes indicative of said keyboard commands and characters;
- providing an alterable memory means including means for storing said codes indicative of said keyboard commands and said characters;
- storing said codes in said memory means in response to said keyboard commands;
- actuating said printing means to effect selection and printing of said characters and underscores in accordance with said generated codes;
- moving said printing means in a forward direction, in response to said keyboard commands and in accordance with the amount of distance for selected ones of said keyboard commands in accordance with predetermined amounts of width of said characters associated with said keyboard commands;
- altering said codes stored in said memory means upon the printing of an underscore, to indicate the existance of an underscore;
- generating an erase signal to initiate an erase sequence of operations comprising:
- reading said codes stored in said alterable memory means in reverse order of storage in response to said erase signal;
- determining whether a character represented by said code is underscored;
- commanding a reverse movement of said printing means;
- determining the width of movement associated with said codes stored individually in reverse order of storing in said memory means in response to said erase signal;
- determining the width of movement associated with said underscore where said altered codes represents an underscored character in response to said erase signal;
- determining the least width of movement associated with said underscore and said character which is represented by said altered code;
- moving said printing means in reverse direction in response to said commanding a reverse movement, a width of movement determining as said least width;
- obliterating said underscore;
- determining the excess of width of movement associated with the character represented by said code over the width of movement associated with said underscore, if any,
- moving said printing means in reverse direction a width equal to said excess of width;
- obliterating the remainder of said underscore;
- obliterating said character represented by said altered code, whereby characters having a proportionally spaced relation to other characters, wider than the width of an underscore may be erased along with the underscore without leaving residual portions of said underscore.

4,392,759
QUICK DISCONNECT MECHANISM FOR SHAFTS

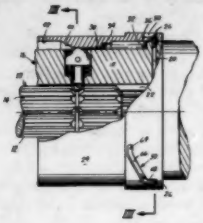
Paul M. Cook, South Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 9, 1981, Ser. No. 232,459
Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—11 **3 Claims**

1. A quick disconnect mechanism for the transmission of torsional power between two concentric shafts, comprising:
- a first shaft having a first longitudinal axis;
- a second shaft in operable engagement with said first shaft and having a second longitudinal axis which is coaxial with said first longitudinal axis;
- collar means interengaged with and carried by said second shaft and having relative longitudinal and torsional displacement with respect thereto;

first spring means interengaged with and carried by said collar means and said second shaft which biases said collar means to a first longitudinal disposition with respect to said second shaft;

said collar means and said second shaft having first cam and cam follower means in mutual engagement for converting



torsional movement of said collar means with respect to said second shaft to longitudinal movement of said collar means with respect to said second shaft against the bias of said first spring means and thus translate said collar means to a second longitudinal disposition with respect to said second shaft.

4,392,760

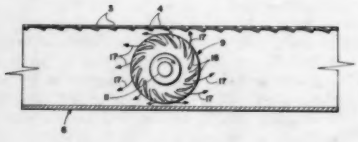
SURFACE FLOW AIR CONVEYOR WITH PLENUM MOUNTED FAN WHEEL

Rudolph E. Futer, Oakland, Calif., assignor to Futerized Systems, Inc., Hayward, Calif.

Continuation of Ser. No. 239,366, Mar. 2, 1981, abandoned, which is a continuation of Ser. No. 80,076, Sep. 28, 1979, abandoned. This application Jun. 9, 1982, Ser. No. 386,512

Int. Cl.³ B65G *51/02*

U.S. Cl. 406—88 **2 Claims**



1. An air conveyor for elevating and moving objects longitudinally along said conveyor comprising:

a. an elongated conveyor member formed with a plurality of directional slit orifices extending substantially evenly spaced there along and substantially the entire length of said elongated conveyor member;

b. an elongated plenum having a bottom wall and sidewalls immediately adjacent to and co-extensive and communicating with said conveyor member and having upstream and downstream ends and formed with a circular supply-air inlet opening in one of said sidewalls having a diameter less than the width of said sidewall;

c. a high performance wheel fan member for pressurizing said plenum totally enclosed within said plenum member and mounted in communication with said supply-air inlet opening.

4,392,761

ROTARY MACHINING TOOLS WITH SIDE COOLANT DELIVERY

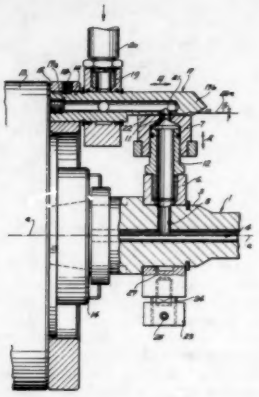
Otto Eckle, Loechgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Apr. 6, 1981, Ser. No. 251,039

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 8012959[U]

Int. Cl.³ B23B *27/10, 51/06, 5/22, 5/34*

U.S. Cl. 408—59 **18 Claims**



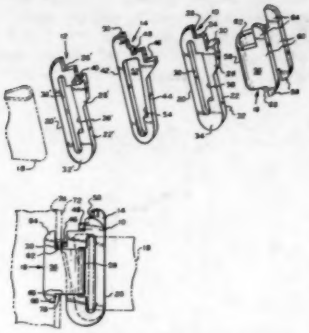
1. An arrangement for supplying a cooling medium to a rotating metal-machining cutting tool provided with cooling medium ducts which communicate with cooling medium bores provided in a cylindrical shank thereof, including a cooling medium supply ring which is supported on and sealed with respect to said cylindrical shank of said tool, can be connected radially outwardly by releasable coupling means with stationary cooling medium supply means and is connected radially inwardly by an annular duct with said cooling medium bores in said shank of said tool, said shank of said tool being receivable in a drive spindle rotatably supported in a housing, said releasable coupling means including a coupling head which is supported near said cooling medium supply ring, is in permanent communication with said supply means and has an outlet bore extending substantially radially with respect to the axis of rotation of said tool shank into a generally radially inwardly facing first sealing surface thereof, and wherein said cooling medium supply ring has a second sealing surface which cooperates with and is arranged to sealingly engage said first sealing surface and in which is provided a substantially radially extending inlet bore connected to said annular duct, the improvement comprising wherein said cooling medium supply ring is rotatably supported on said tool shank and has a radially projecting coupling piece which has thereon said second sealing surface; wherein both said first and second sealing surfaces are substantially flat; wherein said first sealing surface is inclined, in the circumferential direction of said cooling medium supply ring at an acute angle of from 2° to 10° with respect to a line tangent to a circle which is concentric with the axis of said tool shank, which tangent line extends through said outlet bore approximately perpendicular thereto, wherein the distance between said first sealing surface and the axis of said tool shank decreases progressively in the direction of rotation of said tool; wherein said first sealing surface, in the general direction of the axis of said tool shank, diverges in a direction toward a free end of said tool at an acute angle of from 0° to 10°, inclusive; and wherein said second sealing surface has substantially the same inclination as said first sealing surface.

4,392,762

LOCKING WEB FITTING WITH SWIVEL

Charles F. Crissy, and Paul M. Holmes, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed May 15, 1981, Ser. No. 264,028
Int. Cl.³ A44B 21/00; B60P 7/06; B61D 45/00
U.S. Cl. 410—116 8 Claims



1. A releasable fitting for web straps wherein the fitting is mounted within an opening defined in a support member having a locking dimension and a wall thickness comprising, in combination, a pair of substantially flat side plates each having a web receiving opening, an anchor receiving opening, an inner edge, an outer side and an inner side, a latch tab defined upon each side plate adjacent said inner edge thereof and transversely disposed to the plane of the associated side plate extending from said outer side thereof, a substantially flat keeper plate having a web receiving opening defined therein, an inner edge, and a third latch tab defined upon said keeper plate inner edge, said keeper plate having a wider web receiving opening than that of said side plates and being interposed between said side plates' inner sides, a web inserted through said web receiving openings of said side and keeper plates defining a loop, an abutment defined on said keeper plate extending from the plane thereof adapted to abut against a side plate inner edge when said side and keeper plates are in parallel engaged relationship, and a U shaped anchor having an arcuate base loosely extending through said side plates' anchor receiving openings whereby said side plates swivel thereon and are oriented to said anchor base in a predetermined manner, said arcuate base including leg portions each having first and second edges defined thereon extending transversely to the length of said base, a first projection defined upon each leg portion first edge extending therefrom and a second projection defined upon each leg portion second edge extending therefrom, said first and second projections defined upon a common leg portion being in substantial alignment and said first and second projections being in alignment, respectively, said first projections being of greater length than said second projections and the spacing between said first and second leg portion edges being less than the locking dimension of the support member opening whereby said first projections can be inserted into the opening by tilting the anchor, displacing the anchor in the direction of said first edges and then inserting said second projections into the opening, said side plates swiveling upon said anchor base and said latch tabs extending into the opening at all swivel positions of said plates preventing sufficient displacement of said anchor within the opening to remove said second projections therefrom, said wide keeper plate web receiving opening permitting displacement of said keeper plate to selectively remove said third latch tab from the opening permitting removal of said anchor therefrom.

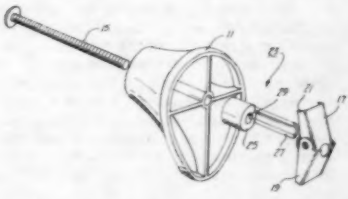
5. A releasable fitting for web straps comprising, in combination, a pair of side plates each having a web receiving opening, an anchor receiving opening, an inner edge, an outer side and an inner side, a latch tab defined upon each side plate adjacent said inner edge thereof extending from the associated outer side, a keeper plate having a web receiving opening defined therein, an inner edge, and a third latch tab defined upon said keeper plate inner edge, said keeper plate having a wider web receiving opening than that of said side plates and being disposed between said side plates' inner sides, a web inserted through said side and keeper plates web receiving openings defining a loop, an abutment defined upon said keeper plate extending from the plane thereof adapted to engage a side plate inner edge when said side and keeper plates are in parallel engaged relationship, and a U shaped anchor having leg portions interconnected by a convex base extending through said side plates' anchor receiving openings loosely supporting said side plates on said base in a predetermined manner whereby said plates swivel with respect to said anchor, said leg portions including aligned first and second sets of projections for affixing said anchor to a support member through an opening, said latch tabs being disposed adjacent each other and adjacent said first set of projections.

4,392,763

DEVICE FOR USE WITH A TOGGLE BOLT

Russell L. Brown, 1620 Kingsbury La., Oklahoma City, Okla. 73116

Filed Aug. 18, 1980, Ser. No. 178,830
Int. Cl.³ F16B 21/00
U.S. Cl. 411—342 4 Claims



1. A securing device for fastening to a securing member of predetermined thickness through a hole of predetermined size in said securing member, comprising:

a threaded bolt of predetermined diameter;

a toggle threadable to said bolt having a pair of spring opened wings for expanding and bridging said hole and thereby anchoring said bolt to said securing member as said toggle is threadably tightened by said bolt against said securing member;

a spool for extending about said bolt in said hole in said securing member having a supportive axial length approximately equal to said predetermined thickness of said securing member for supporting said toggle as it is threadably tightened against said securing member to prevent said toggle from crushing said securing member, said spool having an axial opening through which said bolt can closely extend and a radial periphery for closely fitting within said hole in said securing member such that said bolt is radially fixed in said hole when said spool extends about said bolt in said hole;

a cantilever guide leg for orienting and guiding said toggle with respect to said securing member as said toggle is threadably tightened against said securing member, said guide leg freely extending axially from the radial periphery of said spool such that said bolt extends parallel to said guide leg and such that said toggle is fixedly oriented between said guide leg and said bolt when said spool is positioned in said hole in said securing member and said bolt extends through said opening in said spool and said toggle is threadedly tightened against said securing member by said bolt;

means for fixedly orienting said spool in said hole of said securing member such that said toggle is oriented with

respect to said securing member as said toggle is threadedly tightened against said securing member when said spool is fixedly oriented in said hole; and

means for changing the radial size of said spool such that said spool can be adjusted to fit securing members having holes of differing sizes, including a bushing which can be connected about the periphery of said spool.

2. A support and orientation device for use with a conventional toggle bolt for fastening to a securing member such as a wall through a hole of predetermined size in said securing member, said toggle bolt being of the type having:

a threaded bolt of predetermined diameter;

a toggle threadable to said bolt having a pair of spring opened wings for expanding and bridging said hole and thereby anchoring said bolt to said securing member as said toggle is threadably tightened by said bolt against said securing member;

said support and orientation device comprising:

a spool assembly means for radially supporting said bolt within said hole, axially supporting said toggle to prevent crushing of said support member as said toggle is tightened against said support member, and guiding said toggle to a predetermined orientation with respect to said support member as said toggle is tightened by said bolt, said spool assembly means being removable from and attachable to said toggle bolt so that said toggle bolt can be used conventionally without said spool assembly means, said spool assembly including:

a molded plastic spool for extending about said bolt in said hole in said securing member having a supportive axial length approximately equal to said predetermined thickness of said securing member for supporting said toggle as it is threadably tightened against said securing member to prevent said toggle from crushing said securing member, said spool having a cylindrical axial opening through which said bolt can closely extend and a radial periphery for closely fitting within said hole in said securing member such that said bolt is radially fixed in said hole when said spool extends about said bolt in said hole;

a single cantilever guide leg for orienting and guiding said toggle with respect to said securing member as said toggle is threadably tightened against said securing member, said guide leg freely extending axially from the radial periphery of said spool such that said bolt extends parallel to said guide leg and such that said toggle is fixedly oriented between said guide leg and said bolt when said spool is positioned in said hole in said securing member and said bolt extends through said opening in said spool and said toggle is threadedly tightened against said securing member by said bolt;

means for fixedly orienting said spool in said hole of said securing member such that said toggle is oriented with respect to said securing member as said toggle is threadedly tightened against said securing member when said spool is fixedly oriented in said hole; and

means for changing the supportive axial length of said spool such that the length of said spool can be adjusted to fit securing members of differing thicknesses, comprising at least one disc which connected to an axial end of said spool.

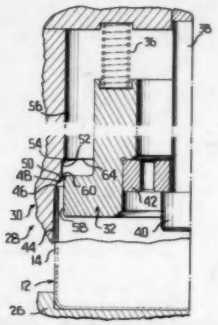
4,392,764

NECKED-IN CONTAINER BODY AND APPARATUS FOR AND METHOD OF FORMING SAME

Charles S. Kubis, Weston, Conn., and John Walter, Evergreen Park, Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Sep. 18, 1981, Ser. No. 303,685
Int. Cl.³ B21D *51/26*
U.S. Cl. 413—69 **8 Claims**

1. A method of necking-in a container body comprising the steps of providing a neck-in ring and a center ring; said neck-in ring having an inner generally cylindrical guide surface joined to a frustoconical necking surface by a first in-turned radius, an inner cylindrical sizing surface joined to said frustoconical necking surface by an out-turned radius, said sizing surface terminating in a second in-turned radius; and said center ring having an outer cylindrical sizing surface terminating in a third in-turned radius; positioning said outer cylindrical sizing surface in telescoped radially opposing relation to said guide surface and said necking surface with said third in-turned radius generally radially opposing said out-turned radius; and with said neck-in ring and said center ring in said telescoped radially opposing relation effecting relative telescoping thereof with a free end of a container body with the container body



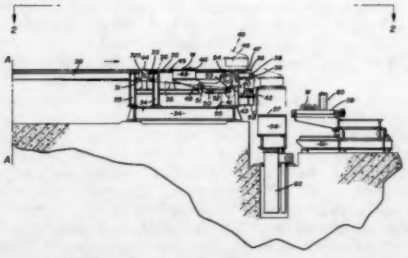
being guided into engagement with said first in-turned radius and said frustoconical necking surface and being radially inwardly shaped thereby until a free edge of the container body is generally overlapping said out-turned radius and said third in-turned radius; and then while retaining said center ring stationary relative to the container body continuing the telescoping of said neck-in ring and the container body until said second in-turned radius opposes said third in-turned radius to define on the container body a cylindrical end portion of reduced radius terminating in an in-turned terminal portion for facilitating the starting of the cylindrical end portion into telescoped relation with another container component.

4,392,765

ANGLE STACKING AND INVERTING DEVICE

Dale S. Barton, Leetonia, and Richard M. Heck, Columbiana, both of Ohio, assignors to Riise Engineering Company, Inc., North Lima, Ohio

Filed Apr. 1, 1981, Ser. No. 250,082
Int. Cl.³ B65G *57/081, 57/18*
U.S. Cl. 414—30 **4 Claims**



1. An improvement in a device that groups and stacks lengths of ferro-magnetic material, said device having a first conveyor with a plurality of spaced material engaging portions on which said lengths of material are positioned, stops at one

end thereof, groups of link chain conveyors arranged with their adjacent ends in overlapping side by side relation, one of said chain link conveyors being movable vertically between a first position below the material engaging portion of said first conveyor to a second position above the surface of the material engaging portion of said first conveyor, and one of said chain link conveyors positioned transversely of said first conveyor between said spaced material engaging portion thereof for moving said lengths of material sidewardly from said first conveyor to selected stations, the improvement comprising a handling mechanism adjacent said stations arranged to magnetically pick up said material at said stations and deposit it in a predetermined position, said handling mechanism comprising a device selectively engagable with the upper and lower surfaces of said material and movable in an arcuate path between said selected stations and said predetermined position and means for moving said device and energizing and de-energizing the same.

4,392,766

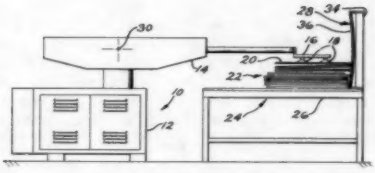
AUTOMATIC FEEDING APPARATUS

Thomas O. Blunt, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 21, 1981, Ser. No. 304,223

Int. Cl.³ B65G *59/04*; B65H *3/16*

U.S. Cl. 414—113 **6 Claims**



1. Automatic feeding apparatus for transferring magnetizable work pieces to a work station comprising:

a robot having a work arm pivoted about a point and having a work piece pick-up end movable through a segment of a sphere with vertical movement of the work arm about the pivot point scribing an arc, said work arm having means to pick up, hold and release a work piece;

a work piece stacking assembly including:

a base for holding a vertical stack of magnetizable work pieces;

a vertical butt plate above the base curved correspondingly to the arc scribed by the vertical movement of the work arm;

magnet means operable to magnetize the work pieces through the vertical curved butt plate to set up a repelling force between the work pieces to vertically separate the work pieces in the upper portion of the stack and urge the separated work pieces against the vertical curved butt plate, and

a work station for receiving the work piece located within the sphere segment through which the work piece pick-up arm end of the robot is movable.

4,392,767

STORAGE APPARATUS INCLUDING CONVEYOR MEANS

Klaus Ischebeck, Elisabethstrasse 20, 4503 Dissen, Fed. Rep. of Germany

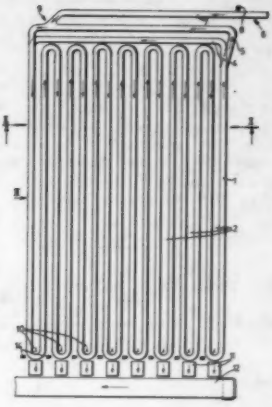
Filed Feb. 20, 1981, Ser. No. 236,399

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010884

Int. Cl.³ B65G *1/06*

U.S. Cl. 414—136 **14 Claims**

1. Storage apparatus for articles capable of being retrieved comprising at least one conveyor means disposed generally on a plurality of planes located one above the other, said conveyor means being arranged in a generally sinuous manner in each plane with the conveyor means in each plane comprising a plurality of joined loops each having generallly U-shaped portions and generally straight portions with said straight portions being disposed side-by-side in generally parallel array,



a receiving station means for receiving articles and transferring said articles to said conveyor means, and take-off means for taking off articles from said conveyor means, said take-off means being arranged within at least one of said U-shaped portions for taking off articles from said conveyor means as said article is disposed in said at least one U-shaped portion of said conveyor means.

4,392,768

INTERMEDIATE STORAGE BAKING TINS

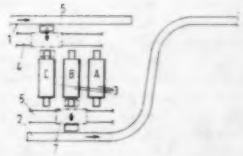
Pieter Van Capelleveen, Zeist, Netherlands, assignor to Gebr. van Capelleveen B.V., Utrecht, Netherlands

Filed Sep. 29, 1980, Ser. No. 192,040

Claims priority, application Netherlands, Sep. 28, 1979, 7907258

Int. Cl.³ B65G *1/06*

U.S. Cl. 414—278 **4 Claims**



1. Apparatus for storing a plurality of different types of baking tins comprising: a baking tin supply conveyor; a baking tin discharge conveyor spaced from and having a portion generally parallel to a portion of said supply conveyor; a plurality of storage racks arranged side-by-side between said portions of said conveyors, each storage rack having a supply end facing said supply conveyor and a discharge end facing said discharge conveyor and each storage rack including a plurality of horizontal carriers extending from the supply end to the discharge end of the respective rack, the carriers of each rack having a length sufficient to receive a horizontal row of baking tins and being arranged one above another in vertically spaced-apart relationship; and transfer means for removing

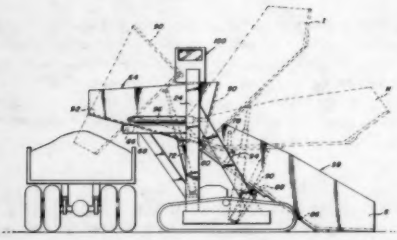
baking tins from said supply conveyor, delivering the removed baking tins to the supply ends of said carriers in a manner to form horizontal rows of baking tins on said carriers, removing baking tins from the discharge ends of said carriers and delivering the so-removed baking tins to said discharge conveyor, said transfer means including a first endless conveyor located between said supply conveyor and the supply ends of said racks, said first conveyor having an upwardly movable run and a downwardly movable run, said runs having baking tin pickup and releasing means projecting therefrom and said upwardly movable run facing said supply conveyor, said transfer means further including a second endless conveyor located between said discharge conveyor and the discharge ends of said racks, said second conveyor having an upwardly movable run and a downwardly movable run, said runs having baking tin pickup and releasing means projecting therefrom and said downwardly movable run facing said discharge conveyor, said first and second conveyors being movable ,arallel to their respective racks so as to be positionable adjacent an end of any desired rack.

4,392,769

HEAVY DUTY MOBILE LOADING STRUCTURE AND SYSTEM

Sterling W. Lowery, 6013 Pollard Dr., Richmond, Va. 23226

Filed Feb. 20, 1981, Ser. No. 236,639
Int. Cl.³ B65G *67/04*
U.S. Cl. 414—397 **16 Claims**



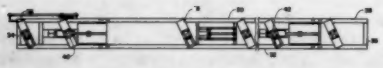
1. A heavy duty truck loading means carried on a mobile transporter for receiving material pushed by the blade of a bulldozer means onto the loading means for loading into a truck, comprising: a self-propelled carrier, a ramp means adapted to receive material bulldozed onto said ramp means, a support on said carrier upon which said ramp means is movably mounted, a dump means carried by a support on said carrier to hold said dump means above the truck to be loaded, said ramp and dump means being independent elements having powered means operative to raise and lower said ramp and dump means independently one with respect to the other for positioning the ramp means to receive material that is bulldozed thereonto and position said dump means to receive material from said ramp and empty the material into said truck positioned under said dump means.

4,392,770

PIPE HANDLING APPARATUS

Dale J. Castille, P.O. Box 2697, Lafayette, La. 70502

Filed Oct. 23, 1980, Ser. No. 200,070
Int. Cl.³ B65G *39/02*
U.S. Cl. 414—432 **15 Claims**



1. A pipe handling mechanism for selectively transporting lengths of pipe from a horizontal pipe rack, transporting the pipe linearly from the pipe rack to apparatus doing work on the lengths of pipe and returning the worked pipe to the pipe rack, said pipe handling mechanism comprising:

a base structure;

a pipe elevation frame;

first elevator means being a plurality of elevator leg structures being pivotally interconnected at the lower extremities thereof to said base and pivotally interconnected at the upper extremities thereof to said pipe elevation frame;

first power means for selectively and controllably moving said elevator leg structures and causing selective raising and lowering of said pipe elevation frame relative to said base structure;

a plurality of angulated pipe transfer rollers being rotatably supported by said pipe elevation frame and adapted, when rotated, to impart spiral linear movement of pipe supported thereby;

means for imparting controlled rotation to at least one of said angulated pipe transfer rollers;

pipe alignment and support roller means;

second elevator means being pivotal support means pivotally interconnected at the lower extremities thereof to said pipe elevation frame and pivotally interconnected at the upper extremities thereof to said pipe alignment and support roller means;

second power means for controllably moving said pipe alignment and work support means;

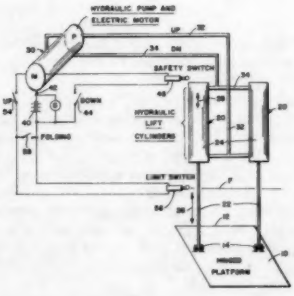
control means selectively actuating said first and second power means to elevate pipe from a pipe rack to a selected elevation, transfer the pipe linearly to accomplish working thereof, elevate said pipe alignment and support roller means to provide rotatable support for said pipe and retract said pipe transfer rollers from contact with said pipe during working of said pipe.

4,392,771

LIFT SAFETY SWITCH SYSTEM

Raymond L. Smalley, Carey, Ohio, assignor to REB Manufacturing, Inc., Carey, Ohio

Filed Dec. 22, 1980, Ser. No. 218,613
Int. Cl.³ B60P *1/46*
U.S. Cl. 414—545 **3 Claims**



1. In a fluid-operated lift comprising:

(A) a frame,

(B) a platform vertically foldable and vertically movable relative to said frame,

(C) a fluid-operated reciprocating motor comprising a cylinder and a piston in said cylinder, said motor being connected between said platform and said frame for moving said platform to and from a vertical folded to a horizontal position and to and from its highest horizontal position to its lowest horizontal position,

(D) a source of power comprising an electric motor for operating said reciprocating motor,

(E) an electric circuit and manually operated switch means for controlling said electric motor for controlling said reciprocating motor intermediate the limits of travel of said platform relative to said frame, and

(F) a limit switch means for stopping the operation of said reciprocating motor when said platform is in its highest horizontal position between its limits of travel in a horizontal position, and manual switch means for overriding said limit switch to fold said platform into its vertical position;

the improvement comprising:

(1) vertical slot means between said cylinder and said frame for supporting said reciprocating motor and said platform in said frame,

(2) microswitch means mounted on said frame adjacent said reciprocating motor,

(3) cam means on said cylinder for operating said microswitch means when said reciprocating motor is raised in said vertical slot means caused by an obstruction in the downward path of movement of said platform from its vertical folded position through is highest horizontal position to its lowest horizontal position, and

(4) means responsive to the operation of said microswitch means for controlling said reciprocating motor to discontinue further downward movement of said reciprocating motor.

4,392,772

LOAD LIFTING CARRIAGE HAVING SIDE SHIFT ADJUSTABLE FORKS

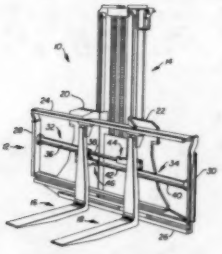
Jerry L. Reeves, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/00380, § 371 Date Apr. 7, 1980, § 102(e) Date Apr. 7, 1980, PCT Pub. No. WO81/02885, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 7, 1980, Ser. No. 245,239

Int. Cl.³ B66F 9/06

U.S. Cl. 414—667 **13 Claims**



3. In a load lifting carriage (12) having upper and lower spaced apart substantially horizontal rails (24,26), a pair of opposite spaced apart sides (28,30) and a vertical centerline, first and second forks (18,16) each being mounted on said rails (24,26) and movable along said rails (24,26), and first and second extensibly movable independently operable cylinders (32,34) each being connected to said carriage (12); the improvement comprising:

first means (44) for selectively coupling said first cylinder (32) to said first fork (18) at a first location longitudinally relative to said first cylinder (32), at which said first fork is movable in response to movement of said first cylinder along said rails (24,26) between said centerline and a location closely adjacent one of said sides (28,30), and for coupling said first cylinder (32) to said first fork (18) at a second location longitudinally relative to said first cylinder (32) and spaced from said first location, at which said first fork is movable in response to movement of said first cylinder along said rails (24,26) between a location spaced a greater distance from said one side (28,30) to a location past said centerline; and

second means (46) for coupling said second cylinder (34) to said second fork (16) at a third location longitudinally relative to said second cylinder (34), at which said second fork (16) is movable in response to movement of said second cylinder (34) along said rails (24,26) between said centerline and a location closely adjacent the other of said sides, and for coupling said second cylinder (34) to said second fork (16) at a fourth location longitudinally relative to said second cylinder (34) and spaced from said third location, at which said second fork (16) is movable in response to movement of said second cylinder (34) along said rails (24,26) between a location spaced a greater distance from the other side (28) to a location past said centerline.

4,392,773

CARRIAGE ASSEMBLY WITH SHIFTABLE FORKS

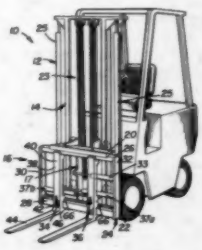
Richard J. Johannson, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US80/01265, § 371 Date Sep. 22, 1980, § 102(e) Date Sep. 22, 1980, PCT Pub. No. WO82/00997, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 22, 1980, Ser. No. 261,105

Int. Cl.³ B66F 9/12

U.S. Cl. 414—667 **9 Claims**



1. In a load lifting apparatus (10) having a generally vertically oriented mast assembly (12) and a carriage assembly (16) having an upper generally horizontal member (20) and a lower generally horizontal member (22) and being mounted to and translatable along said mast assembly (12), a side shifter (24) having upper (26) and lower (28) generally horizontal bars connected together and being mounted to and laterally translatable along said members (20 and 22), and a generally "L" shaped tine (36) having a generally vertical leg (38) having a top end portion (40) and a bottom end portion (42) and a generally horizontal leg (44) being associated with said side shifter (24), the improvement comprising:

a roller bracket (17) connected to said generally horizontal members (20 and 22) and rollably mounted on said mast assembly (12);

means (52) for mounting said top end portion (40) of said vertical leg (38) for transferring substantially only horizontal forces from said tine (36) to said upper bar (26);

means (64) for mounting said bottom end portion (42) of said leg (38) for transferring vertical forces directly from said bottom end portion (42) of said vertical leg (38) of said tine (36) to said lower bar (28); and

means (71) for maintaining said lower bar (28) from moving laterally away from said lower member (22), said means (71) being free from interference with relative longitudinal movement between said lower bar (28) and said lower member (22), said maintaining means (71) having a bracket (74) and being connected to said roller bracket (17), said

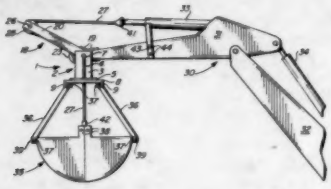
bracket having a finger and said lower bar (28) having a channel (70), said channel (70) extending longitudinally along said lower bar (28) and said finger (76) extending into said channel (70).

4,392,774

CLAM BUCKET ATTACHMENT

Dolphus W. Thomas, Jr., Rte. 1, Box 637, Bastrop, La. 71220

Filed Oct. 5, 1981, Ser. No. 308,400
Int. Cl.[3] B66C *3/06*; E02F *3/44*
U.S. Cl. 414—726 8 Claims



1. A clam bucket attachment for mounting on the crowd of a backhoe, comprising:

(a) A cable boom having a flange means at one end for attachment to the crowd, said cable boom extending from the end of the crowd;

(b) a front sheave rotatably carried by the free end of said cable boom and a rear sheave spaced from said front sheave and rotatably carried by said cable boom forward of said flange means;

(c) a bucket support carried by said cable boom and further comprising a pair of pivot brackets in spaced, generally parallel relationship extending from said cable boom; a pivot bracket plate connecting said pivot brackets; a first collar upward standing from said pivot bracket plate between said pivot brackets; a bucket support plate beneath and adjacent said pivot bracket plate for carrying a clam bucket; a second collar attached to said bucket support plate and extending upwardly and concentrically through said first collar; and a support cap secured to the top of said second collar above said first collar, whereby said bucket support plate and said second collar are rotatable with respect to said pivot bracket plate and said first collar, and the clam bucket is rotatable with respect to said cable boom; and

(d) a cable having one end secured to the piston of a hydraulic cylinder attached to the crowd of the backhoe, said cable wound around said front sheave and said rear sheave and through said support cap, said first and second collar and said bucket support plate, and the opposite end of said cable secured to the clam bucket, whereby extension and retraction of the hydraulic cylinder opens and closes the clam bucket, respectively.

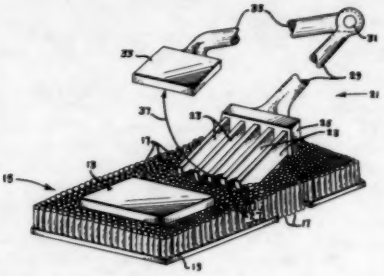
4,392,775

FLAT WORKPIECE PICKUP

Gerald E. Ennis, Grand Prairie, Tex., and Mario Colombo, Jr., St. Louis County, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 9, 1980, Ser. No. 195,693
Int. Cl.[3] B66F *19/00*
U.S. Cl. 414—729 5 Claims

1. In combination, a compliant table surface for supporting a flat workpiece thereon, said compliant table surface comprising a rigid base member and a plurality of vertical upstanding closely spaced bristle-like elements affixed at the lower ends thereof to said rigid base member, the free upper ends of said bristle-like elements forming a level work surface; and an end-effector for firmly grasping said workpiece for transportation to a different location, said end-effector comprising a lower member having a plurality of tines extending forwardly from a block, each of said tines being rectangular in cross-section over their entire length up to their forward ends, the forward ends of each of said tines being curved upwardly from the bottom surface of said tines to the top surface of said tines, a handle portion extending rearwardly from said block, and a single upper member having a flat planar grasper corresponding in size to the said plurality of tines positioned substantially parallel to said upper surface of each of said plurality of tines with a handle portion extending rearwardly therefrom, the



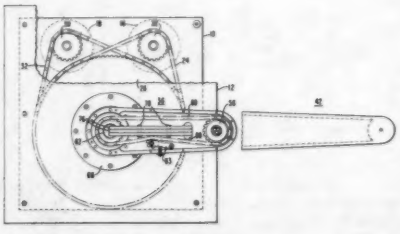
rearward end of the handle of said lower member being pivotally attached to the rearward end of the handle of said upper member to form said end-effector whereby the tines on the lower member of said end-effector can be inserted into the compliant table surface and moved under the workpiece, the grasper on the upper member of said end-effector being pivotable downward to firmly grasp the workpiece thereby allowing the workpiece to be picked up for transportation to a different location without disturbing the original orientation of the workpiece.

4,392,776

ROBOTIC MANIPULATOR STRUCTURE

Lanson Y. Shum, Salem Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1981, Ser. No. 264,153
Int. Cl.[3] B25J *3/00*
U.S. Cl. 414—744 R 7 Claims



1. A robotic manipulator structure comprising:

a base supporting first and second independently operable motorized drive means;

a first generally hollow arm rotatably supported by said base and means for driving said first arm from said first drive means for rotation through one planar space;

a second arm having one end rotatably carried, by the end of said first arm opposite said base, for rotation through another planar space, parallel to and translationally displaced from said first planar space; and

means coupled said second drive means to drive said second arm independently of said first arm, said coupling means

extending from said base through said first arm to said one end of said second arm;

said driving means for said first arm includes a hollow shaft rotatably supported from said base and fixed at its one end to said first arm and having, at its other end, driven means coupled to said first drive means; and

said coupling means for said second arm includes a shaft concentrically and rotatably disposed within said first hollow shaft, said second shaft being hollow and defining an interiorly open space, and having at its one end toothed gearing coupled by toothed linking means through said first arm to drive said second arm, and at the other end of said second shaft driven means coupled to said second drive means.

4,392,777

PUMP OR BLOWER, IN PARTICULAR FOR HEATING AND AIR-CONDITIONING SYSTEMS

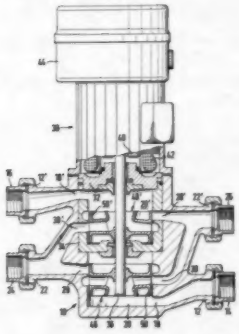
Herbert Hüttlin, Lörracher Strasse 14, D-7853 Steinen, Fed. Rep. of Germany

Filed Jan. 12, 1981, Ser. No. 223,989

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002210

Int. Cl.³ B23B 47/00

U.S. Cl. 415—131 **8 Claims**



1. A pump or blower, in particular for heating and air-conditioning systems, comprising:

(a) a casing, said casing having

i. a primary impeller chamber;

ii. a secondary impeller chamber;

iii. a primary suction duct constantly connected to said primary impeller chamber;

iv. first and second primary pressure ducts adapted for connection to said primary impeller chamber;

v. a secondary suction duct constantly connected to said secondary impeller chamber;

vi. first and second seconary pressure ducts adapted for connection to said secondary impeller chamber;

vii. said second primary pressure duct being constantly connected to said first primary pressure duct;

(b) a pair of impellers mounted on a common shaft in said casing, said pair of impellers comprising:

i. a primary impeller in said primary impeller chamber; and

ii. a secondary impeller in said secondary impeller chamber; and

(c) shifting means for shifting said pair of impellers between

i. a first end position in which said primary impeller connects said primary impeller chamber only to said first primary pressure duct and wherein said secondary impeller connects said secondary impeller chamber only to said first secondary pressure duct and

ii. a second end position in which said primary impeller connects said primary impeller chamber only to said secondary primary pressure duct and wherein said secondary impeller connects said secondary impeller chamber only to said secondary pressure duct.

4,392,778

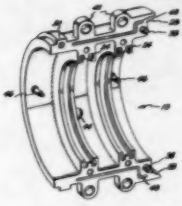
DOUBLE FLOW REHEAT DIAPHRAGM

John M. Hess, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,894

Int. Cl.³ F01D 9/04

U.S. Cl. 415—139 **15 Claims**



1. An inner web of a diaphragm for use in a double flow section of a steam turbine having a rotor shaft with a plurality of bucket wheels affixed thereto, said wheels rotate about the axis of said shaft between a plurality of stationary nozzle rings formed by curved partitions, said web comprising:

a first cylindrical shell formed in two joinable halves for surrounding a portion of said rotor shaft, said first shell having at least two circular grooves along the inner periphery thereof for holding steam packing material in close proximity to said rotor shaft, said first shell also having a surface around the outer periphery of a first end thereof for attachment of curved partitions;

a second cylindrical shell formed in two joinable halves for surrounding the second end of said first shell, said second end being displaced along said axis from said first end, and said second shell also having a surface around the outer periphery thereof for attachment of curved partitions; and

means for holding said second shell in a relatively fixed position around said first shell but permitting limited axial movement between said first and said second shell.

4,392,779

MARINE DRIVE WATER PUMP

James L. Bloemers, Fond du Lac; James M. Schiek, Omro; Michael E. Frazzell, Neenah, and Michael A. Karls, Hilbert, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 146,528, May 5, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,508

Int. Cl.³ F04D 5/00, 29/42

U.S. Cl. 415—141 **5 Claims**

1. In a marine drive having a water cooled engine rotating a drive shaft and having a cooling water intake, the improved water pump comprising:

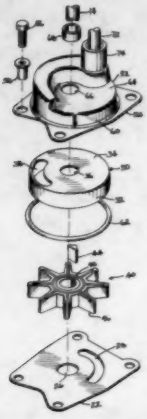
(a) a base plate mounted in said marine drive, said base plate having an eccentrically positioned drive shaft opening and a water inlet opening into the cooling water intake,

(b) a cup-shaped impeller housing formed of deformed sheet metal having an end wall and a peripheral wall, said end wall having an eccentrically positioned drive shaft opening and a water outlet,

(c) an impeller positioned in said impeller housing for propelling water received at said water inlet out said water outlet, said impeller having a central hub coupled to the drive shaft and a plurality of flexible impeller vanes extending outwardly from said central hub into contact with the peripheral wall of said impeller housing, and

(d) a shroud formed of deformed sheet metal fitting over said

impeller housing to embrace the end wall and peripheral wall of said housing, said shroud being secured to said base plate, said shroud forming an arcuate collecting



chamber between the shroud and the impeller housing to connect said outlet with a water discharge opening for said pump angularly displaced from said water outlet about the axis of the drive shaft.

4,392,780

WIND POWERING OF TURBINE HAVING VARIABLE PITCH VANES

John R. Taft, 27 Mouton Rd., Duxbury, Mass. 02332

Filed Apr. 11, 1978, Ser. No. 895,355

Int. Cl.³ F03D *3/00*

U.S. Cl. 416—17 **8 Claims**

1. A windmill apparatus comprising,

a shaft rotatable about its axis,

vanes connected to said shaft and rotatable therewith,

each said vane being rotatable about a vane axis parallel to said shaft axis,

each said vane including a flexible sheet adapted to form a curved surface under wind pressure,

and camming means adapted to control the orientation of said vanes about said vane axes that is related only to the position of a respective vane about said shaft as said vanes rotate about said shaft axis, for orienting said vanes to go through reaching, running, beating, jibing and tacking modes,

whereby said camming means receives impulses from the jibe mode of said vanes to help position said camming means for the apparent wind acting on said vanes.

4,392,781

HIGH PERFORMANCE BLADE FOR HELICOPTER ROTOR

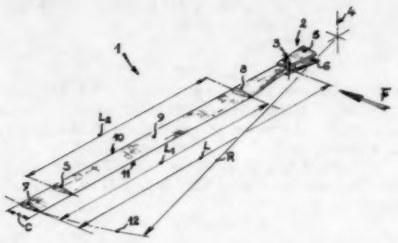
Rene' L. Mouille, Aix-en-Provence; Jacques R. Gallot, Sausset-les-Pins, and Jean-Marc E. Pouradier, Port-Saint-Louis-du-Rhone, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 13, 1981, Ser. No. 243,348

Claims priority, application France, Mar. 25, 1980, 80 06577

Int. Cl.³ B64C *27/46*

U.S. Cl. 416—223 R **5 Claims**



1. A high performance blade for a helicopter rotor having a hub, comprising:

at one end of said blade, an end profile disposed perpendicularly to the leading edge of the blade;

at the other end of said blade, means for fastening said blade to said hub;

a root profile located between said end profile and said other end,

said end profile and said root profile defining along the major part of the span of the blade an aerodynamic surface produced by profiles of substantially constant chord,

each profile having a radius of maximum curvature Ro at the leading edge defined approximately by the expression $Ro=1.7\ Ce^2_{max}$, in which C represents the chord and e_{max} the maximum relative thickness of the profile, and a point of minimum curvature positioned on the lower surface at a distance from the leading edge approximately equal to 20% of the length of the chord of said profile,

said aerodynamic surface having an aerodynamic twist which increases linearly from said end profile to a maximum at said root profile, said twist then being reversed to become zero at said opposite end of the blade,

the angle of twist formed by a zero lift chord of the end profile of said aerodynamic surface and a plane of reference passing through the centre of the hub of the rotor being positive and not more than 0.3 degrees,

the difference between the angles of twist of the root profile and of the end profile being 6°–8°, and

the distance separating said end profile from said root profile being at least equal to 70% of the length of the blade.

4,392,782

LIQUID LEVEL CONTROLLER

Andrew Kuehn, III, St. Paul, Minn., and Edwin G. Hoefs, Dallas, Tex., assignors to Comact Pump Corporation, Dallas, Tex.

Filed Nov. 13, 1980, Ser. No. 206,669

Int. Cl.³ F04B *49/06*

U.S. Cl. 417—36 **13 Claims**

1. Apparatus for controlling the level of a contained liquid by initiating and discontinuing operation of a liquid transfer means mounted to withdraw liquid from the containment, said apparatus comprising:

a high side thermistor operable in a self heating mode and positionable in said containment at a level substantially equal to the highest level of liquid desired to be permitted therein;

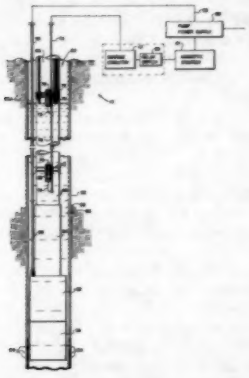
a low side thermistor operable in a self heating mode and

positionable in said containment at a level substantially equal to the lowest level of liquid desired to be permitted therein;

means for flowing a substantially constant current across said thermistors, whereby when a thermistor operating in a self-heating mode is immersed in liquid it dissipates heat more rapidly than when unimmersed, thus increasing in resistance, and proportionally increasing the voltage drop thereacross above that obtained when a thermistor is unimmersed;

means for comparing the voltage drops across said thermistors with at least one reference voltage intermediate in value between the voltage drop across unimmersed and immersed thermistors and generating output signals which are a function of said comparison; and

means responsive to said output signals for switching said liquid transfer means on when said voltage drops across both thermistors are high, indicating that said high side thermistor is immersed, for continuing liquid transfer when said voltage drop across said high side thermistor is low and said voltage drop across said low side comparator is high, indicative of a liquid level between the highest and lowest desired levels, and for switching the liquid transfer means off when said voltage drops are both low, indicating that said low side thermistor is unimmersed.



8. A method for controlling the level of a contained liquid by initiating and discontinuing operation of a liquid transfer means mounted to withdraw liquid from the containment, said apparatus comprising:

positioning a high side thermistor operable in a self heating mode in said containment at a level substantially equal to the highest level of liquid desired to be permitted therein;

positioning a low side thermistor operable in a self heating mode in said containment at a level substantially equal to the lowest level of liquid desired to be permitted therein;

flowing a substantially constant current across said thermistors, where by when a thermistor operating in a self-heating mode is immersed in liquid it dissipates heat more rapidly than when unimmersed, thus increasing in resistance, and proportionally increasing the voltage drop thereacross above that obtained when a thermistor is unimmersed;

comparing the voltage drops across said thermistors with a reference voltage intermediate in value between the voltage drop across unimmersed and immersed thermistors and generating signals which are a function of said comparison; and

switching the said liquid transfer means on when said voltage drops across both thermistors are high, indicating that said high side thermistor is immersed, continuing liquid transfer when said voltage drop across said high side thermistor is low and said voltage drop across said low side comparator is high, indicative of a liquid level between the highest and lowest desired levels, and switching the liquid transfer means off when said voltage drops are both low, indicating that said low side thermistor is unimmersed.

4,392,783

LIQUID RING PUMP EMPLOYING DISCHARGED PUMPING LIQUID FOR DISCHARGE PORT CONTROL

Charles M. Jozepaitis, Bridgeport, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Dec. 12, 1980, Ser. No. 215,577
Int. Cl.³ F04C *19/00*
U.S. Cl. 417—68 **1 Claim**

1. In a liquid ring pump having a bladed rotor eccentrically mounted for rotation in an annular housing supplied with a quantity of pumping liquid, the rotor producing an annular ring of circulating pumping liquid in the housing when rotated and cooperating with the ring of pumping liquid to convey gas from an intake zone to a compression zone having a higher pressure than the intake zone, the improvement comprising:

a first discharge port portion in the housing communicating with a first relatively low pressure portion of the compression zone;

a second discharge port portion in the housing communicating with a second relatively high pressure portion of the compression zone;

a discharge chamber communicating with the first and second discharge port portions for directing a flow of pumping liquid discharged from the second discharge port portion transversely over the first discharge port portion to substantially prevent gas from entering the compression zone via the first discharge port portion when the pressure in the first portion of the compression zone is less than the gas pressure in the discharge chamber, the discharge chamber being shaped to make use of the kinetic energy of the pumping liquid discharged from the second discharge port portion to induce a substantially continuous recirculation of pumping liquid in the discharge chamber, the path of recirculation being (1) circumferentially away from the second discharge port portion in the direction of rotor rotation, (2) radially outward from the second discharge port portion and circumferentially in the direction opposite the direction of rotor rotation, (3) radially inward after passing both the second and first discharge port portions, and (4) circumferentially over the first discharge port portion in the direction of rotor rotation;

baffle means disposed in the discharge chamber for promoting recirculation of the pumping liquid in the discharge chamber; and

a gas discharge outlet communicating with a portion of the discharge chamber bounded by the recirculating pumping liquid for allowing gas to exit from the discharge chamber without interfering with the recirculation of pumping liquid in the discharge chamber.

4,392,784

VALVE ARRANGEMENT FOR VENTING CONDUITS AND PUMPING SYSTEM INCLUDING THE SAME

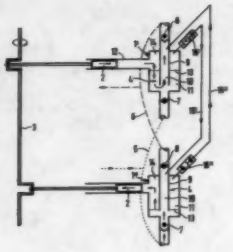
Nabil Hanafi, Urach, Fed. Rep. of Germany, assignor to Pumpenfabrik Urach, Urach, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 309,123

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040478

Int. Cl.³ F04B 9/10

U.S. Cl. 417—103 14 Claims



1. A pumping system for delivering a liquid developing gas or vapor, comprising a plurality of pump units each having a reciprocating pumping element operating at different phases, a working space formed with a gas or vapor collecting zone and a liquid discharging zone, a suction conduit with a suction valve, a pressure conduit with a delivery valve which is arranged in the liquid discharge zone, a venting conduit connected between the gas and vapor collecting zone of one pump unit and the liquid discharge zone of the subsequent pump unit, and a valve arrangement provided in each venting conduit for controlling the discharge of the gas or vapor from the collecting zone in response to the pressure difference between said working spaces.

4,392,785

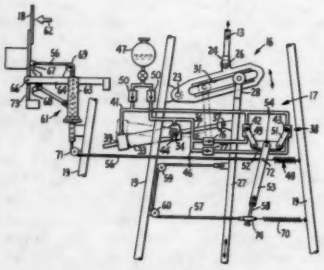
PUMP CONTROL SYSTEM FOR WINDMILLS

Don E. Avery, 45-437 Akimala St., Honolulu, Hi. 96744

Filed Nov. 24, 1980, Ser. No. 209,897

Int. Cl.³ F04B 49/00

U.S. Cl. 417—218 21 Claims



1. In a windmill having a wind driven reciprocating element operating a piston pump, a control system comprising

lever means interposed between said reciprocating element and said pump for varying the length of stroke of the piston in said pump,

and control means responsive to the velocity of the wind to operate said lever means to vary the length of stroke and hence the effective displacement of said pump in accordance with available wind energy,

said control means having a sensing member separate from the windmill formed to be disposed in the wind and displaceable thereby in accordance with wind velocity.

4,392,786

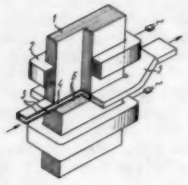
ELECTROMAGNETIC INDUCTION PUMP

Jury F. Merenkov, ulitsa Starykh bolshevikov, 84, korpus 2, kv. 30; Vladimir D. Egorov, ulitsa Krasnoflottsev, 28, kv. 6; Valentin G. Stepanov, ulitsa Malysheva, 107, korpus 1, kv. 28, and Igor V. Popkov, ulitsa 8 Marta, 150, kv. 30, all of Sverdlovsk, U.S.S.R.

Filed Oct. 16, 1980, Ser. No. 197,668

Int. Cl.³ H02K 44/02

U.S. Cl. 417—50 12 Claims



1. An electromagnetic induction pump comprising:

an open magnetic circuit;

an excitation winding provided on said magnetic circuit;

a source of alternating current connected to said excitation winding;

a duct for the flow of an electrically conductive liquid being pumped and situated in the air gap of said magnetic circuit;

a means for electric continuity positioned outside of said air gap and embracing portions of said magnetic circuit at an outlet end of said duct relative to the direction of flow, and providing a path for the electric current induced in said conductive liquid to flow outside said air gap of said magnetic circuit, which means is in electrical contact with said conductive liquid and partially embraces said magnetic circuit;

at least portions of said magnetic circuit adjoining said duct having a length l, in the direction of the liquid flow, which is defined by the expression:

$$l \geq 2\sqrt{2/\sigma\mu_o\omega}$$

where

σ = the specific conductivity of the conductive liquid being pumped;

μ_o = the magnetic permeability of the conductive liquid being pumped; and

ω = the angular frequency of the alternating current source feeding the excitation winding,

and provides a nearly exponential decrease of the magnetic induction in said duct along the length l, in the direction of the liquid flow, to the value determined by the given length l.

4,392,787

DIAPHRAGM PUMP

Adolf Notta, Youngstown, N.Y., assignor to Wetrok Inc., Niagara Falls, N.Y.

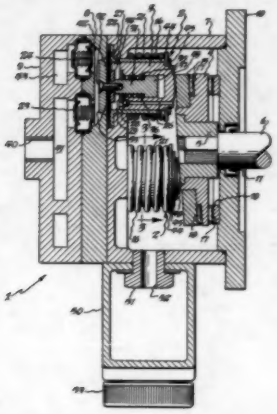
Filed Jan. 21, 1981, Ser. No. 226,830

Int. Cl.³ F04B 1/18, 35/02

U.S. Cl. 417—269 4 Claims

1. In a diaphragm pump of the type having a pump housing, a piston reciprocal within said housing, cam means operatively engaging said piston for reciprocating the same, a diaphragm disposed between said piston and a pumping chamber within said housing, a plunger stem secured to said diaphragm by

screw means rotatable relative to said stem, said piston having a bore and said plunger stem having an end portion extending into said bore, said stem end portion defining a surface slidably engaging the wall of said bore, the improvement comprising:
(a) said engaging surface of said plunger stem end portion and



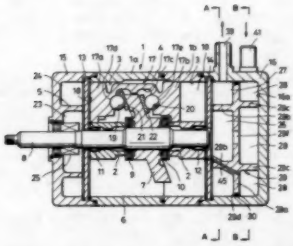
the wall of said piston bore coacting to prevent relative rotation therebetween upon rotation of said screw means relative to said stem to disengage said stem from said diaphragm, and
(b) means constraining said piston against rotation upon such rotation of said screw means.

4,392,788

SWASH-PLATE TYPE COMPRESSOR HAVING OIL SEPARATING FUNCTION

Teruo Nakamura, and Umetarou Iino, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,874
Claims priority, application Japan, Aug. 15, 1980, 55-112327; Aug. 15, 1980, 55-112328
Int. Cl.³ F04B 1/18
U.S. Cl. 417—269 **9 Claims**



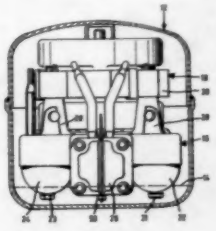
1. A swash-plate type compressor which comprises: a cylinder block horizontally disposed and having a through hole extending along an axis thereof and an oil sump formed at a bottom thereof; a cylinder head mounted at one end of said cylinder block and having a fluid suction port and a fluid discharge port located on top thereof; a valve plate interposed between said cylinder block and said cylinder head; a drive shaft rotatably fitted in said through hole of said cylinder block; a partition member arranged within said cylinder head and axially dividing the interior thereof, said partition member defining a first chamber and a second chamber concentrically arranged on one side thereof facing said valve plate, said first chamber being located radially outwardly for temporarily storing high pressure fluid being discharged from said compressor, said second chamber being located radially inwardly for temporarily storing low pressure fluid being sucked into said compressor, said partition member further defining a third chamber on an opposite side thereof remote from said valve plate, said fluid suction port opening in said third chamber, said third chamber communicating with said second chamber through a hole formed substantially centrally through said partition member for allowing suction fluid to pass therethrough before being fed to said second chamber; a pair of guide members circumferentially extending and arranged within said first chamber, said guide members defining, respectively, a first oil collecting chamber and a second oil collecting chamber located at peripheral portions of said first chamber and opening toward said fluid discharge port; first passage means communicating said first and second oil collecting chambers with said through hole of said cylinder block for guiding oil to said through hole; a guide wall arranged within said third chamber and defining a suction fluid passage spirally extending from said fluid suction port to said central hole of said partition member, said guide wall further defining a third oil collecting chamber at a peripheral portion of said third chamber, said guide wall having a hole formed therein through which oil is introduced into said third oil collecting chamber from said suction fluid passage; and second passage means communicating said third oil collecting chamber with said oil sump for guiding oil to said oil sump.

4,392,789

HERMETICALLY SEALED MOTOR-COMPRESSOR UNIT FOR REFRIGERATORS

Alfredo Bar, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Dec. 9, 1980, Ser. No. 214,766
Claims priority, application Italy, Feb. 20, 1980, 42904 A/80
Int. Cl.³ F04B 39/06
U.S. Cl. 417—312 **3 Claims**

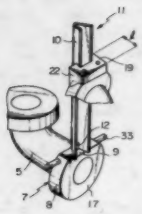


1. A hermetically sealed motor-compressor unit for refrigerators, of vertical axis, comprising a container for said motor compressor unit defining a sump for the gravitational collection of oil therein and a motor compressor unit positioned within said container, said compressor unit comprising a casing defining a plate, a cylinder, silencer portions positioned at the end of said cylinder below said plate, upper support means extending upwardly from said plate, perimetral walls extending upwardly along a portion of the plate and lower support means extending downwardly from the plate supporting said motor compressor in said container; an electric motor supported on said upper support means; spherical caps fastened to said silencer portions to form silencers; a cylinder head defining a suction chamber and delivery chamber interconnected to said silencers; a vertical shaft and a lubricating member disposed on the lower end of said shaft and immersed in said sump.

4,392,790
COUPLING SYSTEM FOR SUBMERGIBLE PUMP

Tomoyuki Shibata, Yokohama; Mitsuhito Nakayama, and Kiyoshi Ouchi, both of Fujisawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jun. 24, 1980, Ser. No. 162,646
Int. Cl.³ F04B 47/00; F16L 27/08
U.S. Cl. 417—360 3 Claims



1. A coupling system for detachably coupling a submergible pump to the lower end of a discharge conduit disposed in water, said system comprising:

a first flange attached to the lower end of said conduit held stationary relative to the bottom of the water, the flange having a first mating surface and a pair of cylindrical rods provided on said first flange relative to said first mating surface and extending horizontally from said first flange in opposite directions, respectively;

a second flange attached to the discharge end of said pump and having a second mating surface;

a single guide rail formed of an angle bar extending vertically and secured at its lower end to said first flange, said rail being provided with two planar sliding portions meeting at an apex line at the outwardly facing surfaces along the length thereof, said apex line being on a side of said rail opposite said pump;

an arm attached to said second flange and including a pair of hook members extending beyond and relative to said second mating surface from the pump side, and a guide means formed on said arm and matable with said two portions of said guide rail so as to be guided by said rail during descending and ascending of said pump, each of said pair of hook members having a downwardly extending tapered surface, wherein, during descending of said pump, each of said tapered surfaces engages one of said pair of rods with a line contact therebetween, said rods and tapered surfaces being constructed such that said rods remain in contact with said tapered surfaces upon the mating of said first and second mating surfaces,

wherein said guide means do not extend to said apex line when said arm and rail are operatively engaged.

4,392,791
PRESSURE PUMPING AND PRIMING PUMP APPARATUS

Harold Mandroian, 2137 Los Amigos, La Canada, Calif. 91001

Filed Sep. 8, 1981, Ser. No. 300,412
Int. Cl.³ F04B 43/10
U.S. Cl. 417—379 10 Claims

1. A pumping apparatus for moving a pumped fluid from a reservoir to a destination in response to variations in the pressure of a first pumping fluid and for being selectively primed in response to externally impressed variations in the pressure of a second pumping fluid comprising:

a pump member having

an input port for receiving pumped fluid from the reservoir,

an exit port for expelling pumped fluid to the destination,

a pumping chamber,

a priming-damping chamber,

an input passageway,

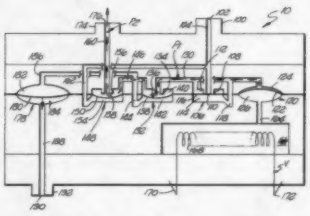
an exit passageway, and

a passageway network between the input passageway and the exit passageway;

a first diaphragm bifurcating the pumping chamber for defining a first pumping chamber section for receiving the pumped fluid and a second pumping chamber section for receiving the first pumping fluid,

variable pressure means for intermittently varying the pressure of the first pumping fluid for alternately increasing the volume of the second pumping chamber section to increase the pressure applied against the pumped fluid and expel it from the first pumping chamber section and decreasing the volume of the second pumping chamber section to decrease the pressure applied against the pumped fluid and draw it into the first pumping chamber section;

a first valve positioned between the input passageway and the passageway network and responsive to the pressure of the pumped fluid in the first pumping chamber section;



a second valve positioned in the passageway network for being responsive to the pressure of the pumped fluid in the first pumping chamber section, the first valve being opened when the second valve closes and the first valve being closed when the second valve opens;

a third valve coupled between the exit passageway and the second valve in the passageway network for preventing pumped fluid flow through the pump member in response to a pressure head at the input or exit ports, the third valve coupled for closing at least one of the first, second, or third valves in response to the head pressure at the input and exit ports;

a second diaphragm bifurcating the priming-damping chamber to define a first priming chamber section for receiving the pumped fluid and a second priming chamber section for receiving the second pumping fluid, the first priming chamber section being interconnected to the passageway network between the second and third valves whereby the pressure of the pumped fluid in the exit passageway is altered in response to deflections of the second diaphragm.

4,392,792
LINEAL MULTI-CYLINDER HYDRAULIC PUMPING UNIT FOR WELLS

George L. Rogers, P.O. Box A-1, Norwood Farms Rd., York Harbor, Me. 03911

Filed Mar. 5, 1981, Ser. No. 240,859
Int. Cl.³ F04B 47/04, 47/14
U.S. Cl. 417—400 41 Claims

1. A pumping unit for reciprocating the rod of a downhole pump for pumping fluid from a well, comprising:

a frame;

a plurality of pressure responsive expansion members coupled together in sequence, each of said expansion members being capable of expanding and contracting to produce a linear reciprocating movement,

gravity centering means connected to said frame and to a first one of said sequence of expansion members for sus-

pending said sequence of expansion members to provide gravity centered alignment thereof over the well; and

control means coupled to at least one of said expansion members for selectively providing pressurized fluid thereto in order to selectively expand or contract said expansion member;

a last one of said sequence of expansion members being connected to the rod of the downhole pump, whereby the total amount of reciprocating movement imparted to the pump rod is equal to the sum of the individual reciprocating linear movements of each of said reciprocating members being selectively expanded or contracted.

4,392,793

FUEL PUMPING APPARATUS

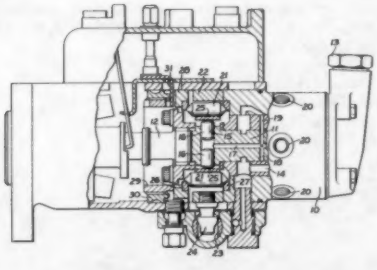
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 8, 1981, Ser. No. 309,791

Claims priority, application United Kingdom, Dec. 5, 1980, 8039035

Int. Cl.³ F04B *19/22, 29/00*

U.S. Cl. 417—462 **2 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a rotary distributor member located in a housing, bores formed in the distributor member and plungers therein, cam followers located at the outer ends of the plungers respectively for engagement with cam lobes formed upon the internal peripheral surface of an annular cam ring surrounding the distributor member, means for feeding fuel to the bores to effect outward movement of the plungers and followers, passage means for conveying fuel from the bores to outlets in the housing, a pair of stop rings positioned in the housing so as to be contacted by end surfaces defined on the cam followers, said end surfaces and the stop rings being shaped so that the axial setting of said stop rings will determine the extent of outward movement of the plungers during the time fuel is supplied to the bores thereby to determine the amount of fuel supplied at each delivery stroke of the apparatus, characterized in that the axial spacing between the end surfaces of at least one of said cam followers is arranged to be smaller than the axial spacing of the end of the other cam follower or followers whereby in use, at the end of the filling strokes of the plungers at least one plunger will be further from the axis of rotation of the distributor member than the other or others so that it will be moved inwardly to effect delivery of fuel before the other plunger or plungers.

4,392,794

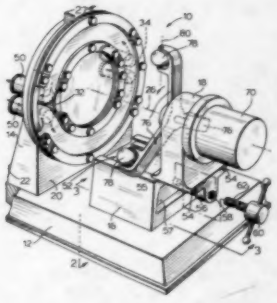
PERISTALTIC PUMP

Arthur Foxcroft, P.O. Box 217, Trenton, Ontario, Canada

Filed Dec. 29, 1980, Ser. No. 220,271

Int. Cl.³ F04B *43/14*

U.S. Cl. 417—475 **1 Claim**



1. A peristaltic pump comprising,

(a) a housing having a front end and a back end, an annular recess formed in the front end of the housing and extending circumferentially about a first axis, said annular recess having a uniform arcuate cross-sectional configuration along its length and a pair of radially spaced side edges at the front end of the housing, first and second passages opening through the housing from the recess to the back end of the housing at circumferentially spaced intervals about the housing,

(b) first and second conduits each having; a back wall shaped to conform to the cross-sectional configuration of the recess and a flexible front wall extending transversely across the back wall, an input end and an output end, said conduits being mounted in said annular recess at circumferentially spaced intervals with the input end and output end of the first conduit extending through said first and second passages respectively, and the input end and output end of the second conduit extending through said second and first passages, respectively, the back wall of each conduit being supported within the recess and the flexible front wall of each conduit extending in a first plane which is perpendicular to the first axis, said conduits each having side flanges which are secured to said housing holding said front wall taut

(c) a pumping member comprising;

(i) a rotor mounted for rotation about said first axis,

(ii) three rollers mounted on said rotor at uniformly spaced circumferential intervals about said first axis each for rotation about a radially directed axis, each roller having a profile adapted to mate with the arcuate cross-sectional configuration of the recess, said pumping member being mounted with said rollers extending into the recess to an

extent sufficient to stretch the front wall of the conduits into engagement with the back wall thereby to form transversely extending occlusions in each conduit,

(d) drive means engaging said rotor to rotatably drive it about said first axis to cause successively formed occlusions to move along each conduit from the input end to the output end to effect pumping in use.

4,392,795

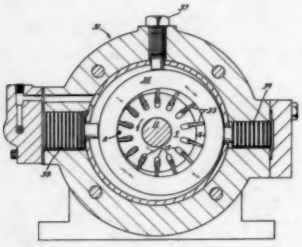
WEAR RESISTANT ROTOR SLOTS FOR VANE-TYPE PUMPS OR MOTORS

Larry C. Smith, New Berlin, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jan. 30, 1981, Ser. No. 229,954

Int. Cl.³ F01C 21/00

U.S. Cl. 418—31 **15 Claims**



1. In a rotor for a vane-type fluid pump or motor, said rotor comprising a toroid having a plurality of planar slots transverse to the circumference thereof; each said slot extending across the entire width of said rotor and through said circumference to form a pair of upper edges at the intersection of said slot and said circumference, said slot being for the receipt of a vane complementary to said slot, said vane having side surfaces and a lower edge and a total depth V in said transverse direction, and being disposed for reciprocation in a direction slightly oblique to said transverse direction in said slot between a retracted position and an extended position, said vane in operation having a range of travel T between the maximum positions of retraction and extension in said transverse direction, and a maximum extension of X beyond said rotor circumference, and having a side in sliding contact with one of said upper edges; the improvement to said rotor which comprises:

a side wall configuration in said slots including an upper portion having a width slightly greater than the width of said vane and opening into said circumference, and also including an undercut portion having a width greater than the width of said slot upper portion;

a lower edge formed within each said slot on a side wall thereof at the junction of said undercut portion and said upper portion of said slot;

said upper portion of said slot having a depth N in said transverse direction, and said undercut portion having a depth W in said transverse direction;

wherein W is greater than T, and V is greater than X plus N;

the width of said undercut portion relative to the width of said upper portion being such that sliding contact between each said slot and its respective obliquely reciprocating vane occurs substantially only on a said one upper edge and said lower edge of said slot and the side surfaces of said vane, while contact between said lower edge of said vane and the sides of said slot is substantially prevented.

4,392,796

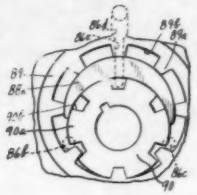
VALVE CONTROLLED REVERSIBLE PUMP WITH ANTICAVITATION MEANS

Herbert E. Lindtveit, Centerport, N.Y., assignor to Sid Harvey, Inc., Valley Stream, N.Y.

Continuation-in-part of Ser. No. 952,308, Oct. 18, 1978, Pat. No. 4,247,267. This application Oct. 8, 1980, Ser. No. 194,973

Int. Cl.³ F04C 2/10, 15/02

U.S. Cl. 418—32 **10 Claims**



1. A rotary pump apparatus adapted to be driven in either direction of rotation and to deliver liquid from the same delivery port for either direction of rotation, comprising:

a. a drive shaft adapted to be rotated in either direction;

b. a pair of meshing gears;

c. a single inlet port communicating with the spaces between the teeth of both gears at their points of widest separation; and

d. two outlet ports respectively located adjacent each of the two possible points of initial engagement of the teeth and connected to said delivery port;

wherein the improvement comprises:

e. means effectively blocking liquid flow from a filled space at said inlet port toward a following evacuated space, said means preventing withdrawal of liquid from the filled space and subsequent cavitation, said blocking means comprising said inlet port, which is narrower than each tooth of each gear, so that each filled space is sealed from the inlet port by the following tooth before the next space to be filled registers with the port.

4,392,797

DEVICE FOR LUBRICATING A ROTARY PISTON AIR PUMP

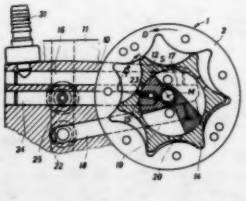
Max Ruf, Neckarsulm, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengeselschaft, Neckarsulm, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,815

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942696

Int. Cl.³ F04C 18/10, 29/02

U.S. Cl. 418—91 **4 Claims**



1. A device for lubricating a rotary piston air pump supported and driven by an engine having a housing penetrated by at least one oil return conduit, said pump comprising; a station-

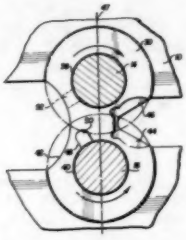
ary axel connected to said housing and having an eccentric with a peripheral surface, a rotary casing rotatably mounted on said axle and accommodating a rotor rotatably mounted on the peripheral surface of said eccentric, said casing and rotor together defining variable volume working chambers, suction and discharge recesses in the peripheral surface of the eccentric, said recesses communicating with suction and discharge conduits within said axle, said axle further comprising an oil supply conduit open to said peripheral surface in a laterally offset position with respect to said recesses, said oil supply conduit continuing in a pipe which has an oil scoop extending into said oil return conduit for catching returning oil and delivering it through the pipe and the oil supply conduit to said peripheral surface.

4,392,798

GEAR PUMP OR MOTOR WITH LOW PRESSURE BEARING LUBRICATION

Charles J. Bowden, Battle Creek, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 3, 1981, Ser. No. 251,003
Int. Cl.³ F04C *29/02, 2/18;* F03C *2/08*
U.S. Cl. 418—102 **15 Claims**



1. An improved rotary gear apparatus comprising:
a housing having low pressure and high pressure chamber;
a pair of shafts mounted for rotation in said housing on bearings supported by said housing;
a pair of gears, one mounted on each of said shafts, said gears having teeth intermeshing at a zone between said low pressure chamber and said high pressure chamber, said teeth sequentially defining initially contracting and then expanding volumes therebetween as said gears intermesh in said zone;
means mounted on each side of said gears for receiving fluid only from a first adjacent one of said bearings on one side of said gears, for passing said fluid directly into one of said expanding volumes and for passing fluid from said low pressure chamber only to a second adjacent one of said bearings on the same side of said gears; and
means for receiving fluid only from said second adjacent bearing and directing said fluid only into said first adjacent bearing.

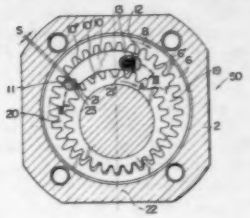
4,392,799

INTERNAL GEAR PUMP MOTOR

Michio Shikano, and Shuzi Kitagawa, both of Toyama, Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan

Filed Dec. 4, 1980, Ser. No. 213,068
Claims priority, application Japan, Dec. 17, 1979, 54-162704
Int. Cl.³ F04C *15/04, 1/06*
U.S. Cl. 418—169 **10 Claims**

1. An internal gear pump motor comprising: a housing; a pinion rotatably supported in said housing; an internal gear rotatably supported in said housing and meshing with said pinion in said housing; and filler piece means located in a space defined between said pinion and said internal gear for dividing the space into two regions which provide a low pressure region and a high pressure region during operation; wherein:
said filler piece means includes at least one filler piece floatingly mounted within said space and having portions capable of coming into sliding engagement with tooth crests of said pinion and tooth crests of said internal gear respectively in a portion of said space where the distance between the tooth crests of the pinion and the tooth crests



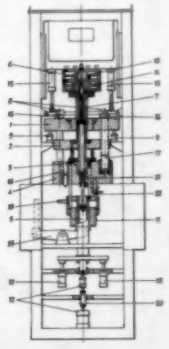
of the internal gear is reduced toward said low pressure region; and
said internal gear pump motor further comprises a stopper pin secured to said housing operative to engage one end of said filler piece on the side of said low pressure region for restricting the circumferential movement of the filler piece toward the low pressure region, and spring means associated with said housing for urging said filler piece toward said low pressure region.

4,392,800

PRESS FOR PULVERULENT MATERIALS

Gennaro Apuzzo, Napoli, Italy, assignor to Merisinter S.p.A., Arzano, Italy

Continuation of Ser. No. 150,574, May 16, 1980, abandoned, which is a continuation of Ser. No. 35,470, Apr. 25, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,586
Claims priority, application Italy, Jul. 24, 1978, 50446 A/78
Int. Cl.³ B30B *11/02*
U.S. Cl. 425—78 **4 Claims**



1. In a press for compressing pulverulent materials into concave-shaped or convex-shaped articles including a press frame, a die carrying plate, a plurality of upper and lower punches, support means for carrying the upper and lower punches and control means for controlling the displacement of the upper and lower punches, a combination comprising: first piston-cylinder means for controlling the displacement of said die carrying plate; second piston-cylinder means fastened to said frame and supporting said die plate; lever means arranged above said die carrying plate and having one end portion

pivoted to said frame and an opposite other end portion; slider means slidable on said opposite end portion and abutting on said die carrying plate, said first piston-cylinder means acting on said other end portion of said lever means to exert thereon a pressure depending on the distance of said slider means from said other end portion of said lever means; first support means for each of said lower punches; third piston-cylinder means fastened to said frame for controlling said first support means; adjustable stop elements for limiting the displacemen range of said die carrying plate and said first supporting means; second support means for supporting the upper punches control means provided within said second supports means and operative for controlling the displacement of the upper punches, said upper and lower punches being concentrically arranged relative to each other; a movable core arranged within said upper and lower punches; a core rod supporting said core; third support means for said core rod, fourth piston-cylinder means for controlling the displacement of said third support means and having a lower end connected to said core rod; and adjustable stop elements for limiting the displacement range of said core rod.

4,392,801

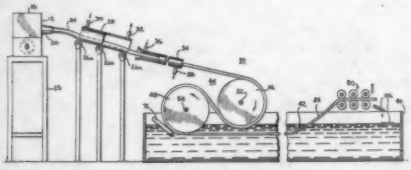
APPARATUS FOR MANUFACTURING CHEESE PRODUCT

Matthew Meyer, 1001 E. 17th St., Marshfield, Wis. 54449

Division of Ser. No. 48,525, Jun. 13, 1979, Pat. No. 4,288,465. This application Mar. 19, 1981, Ser. No. 245,508

Int. Cl.³ B29F *3/02, 3/08*

U.S. Cl. 425—71 **10 Claims**



1. Apparatus for manufacturing a cheese product having a longitudinal fibrous property comprising:

an extruder for extruding a continuous strand of cheese with a horizontal movement component along a path;

cooling means downstream of said extruder in said path for receiving the strand from said extruder for cooling the strand to establish structural integrity in the strand;

means for applying longitudinal tension to the strand after it leaves said cooling means to induce a longitudinal fibrous property into the strand, said tension applying means comprising a pair of rotating drums arranged in a horizontal plane in tandem in the direction of the cheese extrusion path to provide a forward drum and a rearward drum, said tension applying means further including drive means for rotating said drums in opposite rotary directions so that the upper portion of the rearward drum presents a surface moving in the same direction as the horizontal movement component of the strand and the upper portion of the forward drum presents a surface moving in the opposite direction, said drums forming a serpentine path for the strand in which the cheese strand proceeds initially around said rearward drum and thereafter around said forward drum;

a vat containing a cooling fluid for cooling the strand, said drums of said tension applying means being at least partially immersed in the cooling fluid for delivering the strand to the cooling fluid; and

tension maintaining means for said strand, said tension maintaining means being so positioned with respect to said tension applying means and said fluid containing vat as to maintain tension on the strand in the vat.

4,392,802

APPARATUS FOR BLOW MOLDING AND CONDITIONING SYNTHETIC RESIN CONTAINERS

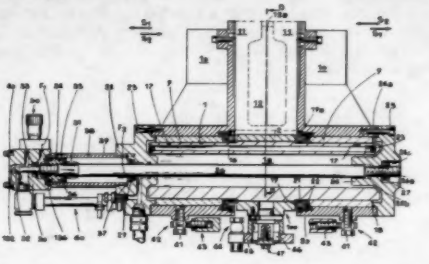
Andrea Bortolotti, and Mauro Bettucchi, both of Bologna, Italy, assignors to Automa S.p.A., Bologna, Italy

Filed Oct. 30, 1981, Ser. No. 316,776

Claims priority, application Italy, Nov. 14, 1980, 3569 A/80; Oct. 16, 1981, 3551 A/81

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—107 **9 Claims**



1. Improved apparatus for blow molding and conditioning synthetic resin containers, of the type comprising: at least one extruder, fed with granules of a predetermined synthetic resin, from the extrusion head of which, that points downwards and defines an extrusion station, issues in an unbroken fashion a tubular element made of the said synthetic resin; two end walls, able to slide supported and guided by first support means, to which are locked in a removable fashion and in opposite position, corresponding permanent molds which, when in the closed position, jointly define a vacuum forming mold whose upper part is provided with a mouth that communicates with the outside and whose inside part contains the profile of a corresponding container; means for operating the said end walls, the actuation and deactuation of which constitute, for the aforementioned permanent molds, the said position of closure and an open position, respectively; means for synchronizing, in opposite directions, the translation of the said end walls; a saddle that carries the aforementioned support means and slides on rectilineal guides perpendicular to the translation direction of the said end walls, the inclination of the said guides being such as to decrease the elevation of the said end walls, starting at the said extrusion station; means for driving the said saddle between the said extrusion station and a blow molding station; means for shearing the said tubular element, the lower part of which is stably held under restraint in the vacuum forming mold at the time the said permanent molds are in the position of closure, in consequence of the translation of the said end walls from the extrusion station to the blow molding station; at least one nozzle, connected to a source of compressed air, movable vertically, positioned at the said blow molding station and destined to be hermetically inserted into the mouth of the said vacuum forming mold; gripping means, integral with the said end walls, destined to hook onto the container hanging on the said nozzle, to release the said container from the said nozzle, and to deposit the said container on a suitable conveyor; means for controlling the said operating means, destined to actuate and deactuate them compatibly with the positioning of the said end walls at the extrusion station and at the blow molding station, respectively, in the latter case at a time subsequent to the insertion of compressed air into the said vacuum forming mold; a tubular shaft that at least partially houses in the inside thereof the aforementioned operating means; a coupling sleeve fixed to the center of said shaft, said coupling sleeve being positional above and integral with said saddle; at least two bushes coupled to said shaft in a way whereby they are able to slide, said two bushes being positioned bilaterally to said coupling sleeve and each of said bushes being locked to one of two end walls; fixing means for

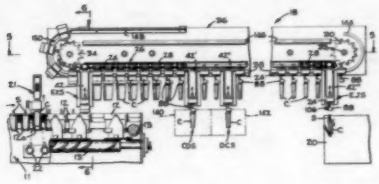
locking said two bushes to said two end walls; means for locking one to the other, the coupling means and the said shaft, destined to prevent any rotation of the latter with respect to the axis thereof; and means for coupling one to the other in a sliding fashion and in the direction parallel to the axis of the said shaft, each end wall and the said saddle, destined to prevent any rotation of the said end wall with respect to the axis of the said shaft.

4,392,803

STICK CONFECTION EXTRACTION APPARATUS

Stephen D. Cross; Elmer F. Frost, Jr., and David N. Anderson, all of Lakeland, Fla., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 146,844, May 5, 1980, abandoned. This application Jun. 18, 1981, Ser. No. 274,987
Int. Cl.³ B28B 3/00
U.S. Cl. 425—126 S 17 Claims



1. An apparatus for simultaneously extracting several stick confections from a row of mold cups of an apparatus for producing the stick confections and for transferring the extracted confections to a receiving area, each confection including a body of confection material and a stick projecting upwardly therefrom and from the mold cup in which it is formed, said extracting and transferring apparatus comprising: a plurality of extractor bar assemblies, each extractor bar assembly including separate gripper units depending therefrom in a row extending longitudinally of the extractor bar assembly, each gripper unit including means for releasably engaging a stick of a confection, means for conveying the extractor bar assemblies from above the extraction area where the confections are to be extracted from mold cups in which they are formed to a receiving area, means at said extraction area for lowering an extractor bar assembly to cause the gripper units to engage the sticks of confections within the mold cups and for thereafter elevating the extractor bar assembly so that it may be conveyed by said conveying means, means at said receiving area for causing said gripper units to release the sticks, and means operatively engageable with said gripper units between said extraction area and said receiving area for rotating said gripper units each through a selected angle.

4,392,804

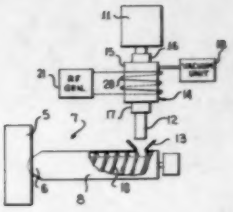
SOLID STATING

Joan C. Pushee, Amherst; Ieuan L. Harry, Nashua; Martin H. Beck, Brookline, and Suppayan M. Krishnakumar, Nashua, all of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Sep. 4, 1981, Ser. No. 299,283
Int. Cl.³ B29B 3/00
U.S. Cl. 425—174.8 E 15 Claims

1. An injection molding system comprising a particulate PET supply source, an extruder, and an injection mold, a supply line between said supply source and said extruder, a housing defining a chamber in which the particulate resin is temporarily stored in isolated condition along said supply line, and means associated with said chamber for effecting solid stating of particulate PET flowing in said housing to raise the intrinsic viscosity of the particulate resin in advance of particulate resin flow from said chamber to said extruder.

12. Apparatus for increasing the intrinsic viscosity of PET, said apparatus comprising a particulate PET supply source, a receptacle for receiving particulate PET having an increased intrinsic viscosity, a supply line between said supply source and said receptacle, a housing defining a chamber for receiving



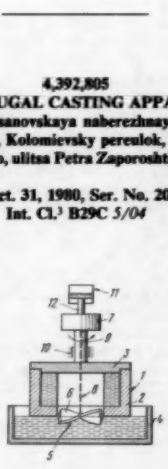
and temporarily storing PET particles, heater means for heating the temporarily stored PET particles in isolated relation along said supply line within said chamber to effect a solid stating reaction of the PET particles flowing in said chamber to raise the intrinsic viscosity of the particulate PET before the PET particles are discharged from said chamber into said receptacle, and gaseous flow means connected to said chamber for removing the products of condensation polymerization.

4,392,805

CENTRIFUGAL CASTING APPARATUS

Oleg L. Golyak, Rusanovskaya naberezhnaya, 24/15, kv. 100; Leonty A. Golyak, Kolomievsky pereulok, 13/23, kv. 44, and Ivan R. Stepurenko, ulitsa Petra Zaporoshtsa, 13-B, kv. 18, all of Kiev, U.S.S.R.

Filed Oct. 31, 1980, Ser. No. 202,703
Int. Cl.³ B29C 5/04
U.S. Cl. 425—206 14 Claims



1. A centrifugal casting apparatus for casting from a melt comprising:

a mold mounted for rotation about the vertical axis thereof and having a bottom provided with a through co-axial opening having vertical walls;

a member having a helicoidally shaped surface, co-axially mounted within said mold for preventing shrink heads formation and having a lower portion extending through said opening outwardly and downwardly of said mold bottom, said member being adapted to be immersed into said melt for cleaning its surface from slag;

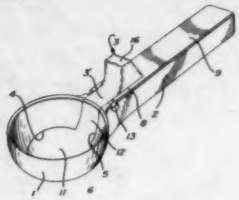
a rotation drive connected with said mold and said member; and

a vertical motion drive connected with said mold and said member.

4,392,806
EJECTING ICE-CREAM SCOOP

Laurent Houle, 371 - 2nd St., East, La Sarre, Quebec, Canada (J9Z 2H8)

Filed Oct. 15, 1981, Ser. No. 311,358
Claims priority, application Canada, Oct. 20, 1980, 362684
Int. Cl.³ B29C 1/00; A23P 1/00
U.S. Cl. 425—286 5 Claims

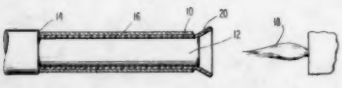


1. An ice-cream scoop comprising a generally semi-spherical bowl, a handle having one end portion fastened to said bowl, said bowl having a top rim, a bottom opening and a slot communicating with said bottom opening and extending to said rim, said handle having a portion adjacent said bowl formed with a cavity opening at the top and at the bottom of said handle and communicating with said slot, said slot being in alignment with said handle, an ejector pivotally mounted on the handle about a pivotal axis transverse to said handle and adjacent the bowl and comprising an arcuate tongue conforming to the interior and exterior surfaces of the bowl and to the shape of said bottom opening and of said slot, so that, when said tongue is bottomed in the bowl, it fills said bottom opening and said slot and is substantially flush with both the interior and exterior surfaces of the bowl, said ejector further including a lever arm rigid with said tongue and extending into said cavity, said lever arm having a portion extending on the opposite side of said tongue relative to the pivotal axis of said ejector, said portion exposed and accessible through the top and through the bottom of said handle, whereby downward manual pressure exerted on said portion from the top of said handle, will cause lifting of said tongue away from the bowl bottom, and upward manual pressure exerted on said portion from the bottom of said handle, will pivot said tongue to bottomed position in said bowl.

4,392,807
APPARATUS FOR CLOSING TUBES

Donald J. Greenspan, 235 Pavilion Ave., Riverside, N.J. 08075

Continuation of Ser. No. 96,339, Nov. 21, 1979, abandoned, which is a division of Ser. No. 965,511, Dec. 1, 1978, Pat. No. 4,219,525, which is a continuation of Ser. No. 770,786, Feb. 22, 1977, abandoned. This application May 11, 1981, Ser. No. 262,698
Int. Cl.³ B29C 24/00
U.S. Cl. 425—393 51 Claims



1. Apparatus for manufacturing a plastic tube having a bottom from an open-ended tube without using additional material for forming the bottom comprising:

a mandrel for extending longitudinally into said tube and supporting said tube thereon, said mandrel comprising a first portion and a second portion, said second portion extending inwardly of said first portion to form the end of said mandrel;

a sleeve surrounding said mandrel with a space therebetween for receiving said tube, said sleeve adapted to move relative to said mandrel to collapse the end of said tube to be closed;

a mold adapted to cooperate with said sleeve and said mandrel for closing the collapsed end of said tube to form said bottom;

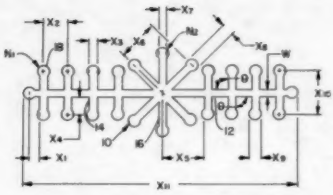
means for heating said mandrel without heating said mold; and

means for controlling the relative position of said sleeve and said mandrel such that the end of said first portion of said mandrel is substantially aligned with the end of said sleeve during said heating prior to movement of said sleeve with respect to said mandrel.

4,392,808
SPINNERET ORIFICE CROSS-SECTIONS

Bobby M. Phillips, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,571
Int. Cl.³ B29H 7/18
U.S. Cl. 425—464 24 Claims



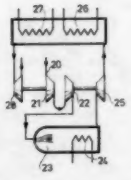
1. A spinneret defining at least one spinneret orifice the planar cross-section of which defines an elongated slot having a plurality of wing member bar slots intersecting with said elongated slot at spaced intervals along the axial length thereof; and

multiple intersecting body section bar slots intersecting with said elongated slot and intersecting with each of the other multiple intersecting body section bar slots at said elongated slot.

4,392,809
METHOD AND PLANT FOR RECOVERING HEAT FROM SMOKE GASES

Lars A. Tieberg, Sju Blommors gränd 3, Fagersta, Sweden S-773 00, and Stig G. Carlqvist, Sanekullavägen 43, Malmö, Sweden

Filed Mar. 9, 1981, Ser. No. 241,618
Claims priority, application Sweden, Mar. 19, 1980, 8002144
Int. Cl.³ F23D 11/44
U.S. Cl. 431—11 9 Claims



1. A method of recovering heat from smoke gases in a combustion plant comprising the steps of compressing air for combustion to a first intermediate pressure in a first compressor, then compressing the air to a second higher pressure in a second compressor, passing the air at said second higher pressure to a combustion chamber, burning a combustible fuel containing water in the presence of said air at said second

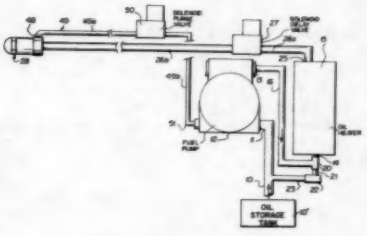
higher pressure in the combustion chamber to produce smoke gases containing water vapor at substantially said second higher pressure, passing said smoke gases at said second higher pressure through a first turbine to drive the turbine and reduce the pressure of said smoke gases to a second intermediate pressure, said first turbine being connected to said second compressor for driving the same, thereafter condensing water vapor in said smoke gases at said second intermediate pressure to regain the heat of vaporazation of the water vapor in the smoke gases, and then passing said smoke gases through a second turbine to drive the turbine and reduce the pressure of said smoke gases to atmospheric pressure, said second turbine being connected to said first compressor for driving the same.

4,392,810

OIL BURNER

John D. Bears, Belle River, and Kenneth R. D. Emery, Wood Islands, both of Canada, assignors to Ener-Tech Heating Systems Inc., Prince Edward Island, Canada

Filed Jan. 5, 1981, Ser. No. 222,752
Claims priority, application Canada, Jan. 29, 1980, 344575
Int. Cl.³ F23N *1/00*
U.S. Cl. 431—37 **10 Claims**



1. An oil burner feed system comprising first pump means connected in a line between an oil storage tank and an inlet of an oil heater, an oil supply line having an inlet connected to an outlet of the oil heater and an outlet connected to a burner nozzle, a purge line having an inlet adjacent the point of connection between the nozzle and the oil supply line and in constant open communication with both the nozzle and the outlet of the oil supply line, second pump means connected in the purge line and an inlet of the oil heater, valve means in the purge line and control circuitry arranged to open the valve means on start-up of the feed system for a predetermined time interval whereby during the predetermined time interval oil is circulated through the oil supply line from the oil heater and through the purge line back to the heater.

4,392,811

GASIFYING DEVICE FOR LIQUID FUEL BURNER

Takao Ito, Sanjo, Japan, assignor to Dainichi Kogyo Co., Ltd., Shirone, Japan

Filed Feb. 13, 1981, Ser. No. 234,432
Claims priority, application Japan, Feb. 16, 1980, 55-018867
Int. Cl.³ F23N *1/00*; F23D *11/44*
U.S. Cl. 431—37 **8 Claims**

1. A gasified liquid fuel combustion apparatus for supplying a gaseous mixture of air and a gasified liquid fuel ejected from a nozzle to a burner for combustion, said apparatus including a gasifying device comprising:

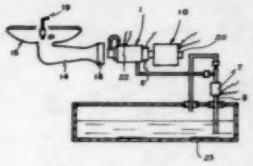
(a) a gasifier including two concentric tubes having front and rear ends and defining a chamber and sealed at least at the rear end thereof and having a concentric inner tube disposed therein, said gasifier and inner tube being in sealed communicating relation with a nozzle head provided concentrically with and at the front end of said inner tube, said nozzle head including a nozzle;

(b) a valve rod provided in said inner tube and having at its front end a valve needle cooperable with said nozzle;

(c) a movable core provided at the rear end of said valve rod;

(d) a solenoid provided at the rear end of said inner tube and operable to move said movable core;

(e) an electric heater provided in a concentric space between said gasifyer and said inner tube;



(f) a fuel delivery pipe connected to the lower rear end of said gasifier and adapted to deliver fuel to the rear end of said gasifier chamber;

(g) means causing said fuel to travel in a helical path around and along said chamber from its rear end to its front end; and

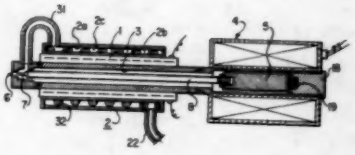
(h) means connecting the front end of said gasifier chamber to said nozzle.

4,392,812

CONTROL CIRCUIT FOR GASIFIED LIQUID FUEL COMBUSTION APPARATUS

Hisao Yoshii, Sanjo, Japan, assignor to Dainichi Kogyo Co., Ltd., Shirone, Japan

Filed Mar. 24, 1981, Ser. No. 247,154
Claims priority, application Japan, Mar. 31, 1980, 55-43557
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—73 **8 Claims**

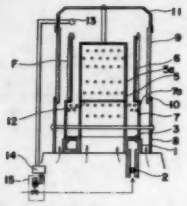


1. A gasified liquid fuel combustion apparatus in which a gasified fuel is emitted from a nozzle having a valve needle actuated by a solenoid and is mixed with combustion air and the fuel-air gaseous mixture thus obtained is supplied to a burner for combustion, comprising a power supply; a solenoid control circuit including a timer circuit adapted to operate upon closing of a power switch; a contact switch adapted to open in response to said timer circuit; a voltage reducing transformer powered from said power supply through said power switch; a first rectifying circuit and a second rectifying circuit connected to said solenoid; said first rectifying circuit receiving from said power supply through said contact switch a voltage higher than but of the same phase as the voltage supplied from said power supply to said second rectifying circuit; said second rectifying circuit receiving a lower voltage from the secondary side of said voltage reducing transformer; said first and second rectifying circuits being connected to a common output line to provide a high DC output voltage until said contact switch is opened but to provide a low DC output voltage thereafter, thereby controlling said solenoid through said solenoid control circuit.

4,392,813
COMBUSTION APPLIANCE WITH SAFETY DEVICE

Eiichi Tanaka, Yamatokoriyama; Noboru Ishibasi, Nabari, and Shojiro Inoue, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 20, 1980, Ser. No. 179,874
Claims priority, application Japan, Aug. 20, 1979, 54-106343
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—76 **5 Claims**

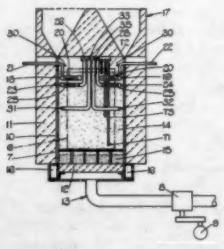


1. A combustion appliance with a safety device therein, comprising a combustor composed of an inner flame cylinder with a plurality of small holes therein, a red-heat cylinder disposed on the outer side of said inner flame cylinder, an outer cylinder disposed on the outer side of said red-heat cylinder, and means for supplying combustable fuel between the inner flame cylinder and the red-heat cylinder, an oxygen sensor disposed in the flame rear flow of said combustor and in a position where the air excess ratio of said flames varies substantially depending on the amount of air available to combust fuel from said fuel supplying means, and a fuel feed cutting-off means for cutting off fuel supplied by said fuel supplying means with the output of said oxygen sensor, said oxygen sensor comprising a partial oxygen pressure sensitive oxygen sensor having a pair of spaced electrodes, the resistance between which varies with the partial oxygen pressure being detected.

4,392,814
FLUIDIZED BED

Brian Harding, West Bromwich, England, assignor to Can-Eng Holdings Limited, Niagara Falls, Canada

Filed Jun. 4, 1980, Ser. No. 156,530
Claims priority, application United Kingdom, Jun. 8, 1979, 7919979; Jul. 9, 1979, 7923683
Int. Cl.³ F23D *19/02*
U.S. Cl. 431—170 **5 Claims**



1. A fluidized bed having a container for containing a mass of refractory particles, a porous base, conduit means for supplying a fluidizing medium to the underside of said porous base from which said medium will flow through the porous base and into the mass of refractory particles, an adjustable valve for the conduit means and means, disposed above said porous base, for supplying heat to the mass of refractory particles, the fluidized bed comprising:

a pair of temperature transducers disposed at vertically spaced positions above the upper surface of said porous base, said transducers being connected together to provide a signal which is dependent upon the difference in the temperatures at said vertically spaced positions;

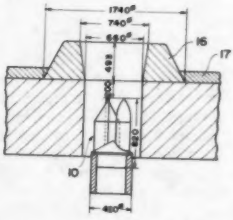
power-actuated means arranged to receive said signal and to actuate said adjustable valve in accordance with the signal received; and,

second conduit means disposed in the upper part of said bed, but beneath the upper surface of the mass of refractory particles when fluidized, for admitting a gas into said upper part of the bed, said second conduit means being connected to supply pipes which extend at least in part downwardly into the container from the upper end thereof without passing through the wall of the container at positions below the level of said upper surface of the mass of refractory particles when fluidized.

4,392,815
BURNER FOR BOTTOM FIRED FURNACE

Minoru Matsuzaki; Toshiei Kawauchi, both of Chiba; Tsugio Murakami, Ichihara, and Hideo Kishira, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Feb. 17, 1981, Ser. No. 234,911
Claims priority, application Japan, Jul. 17, 1980, 55-97938
Int. Cl.³ F23C *5/08*
U.S. Cl. 431—175 **6 Claims**



1. A burner for a bottom fired, ingot heating furnace having a burner port through the bottom of said furnace, and comprising:

a gas header centrally disposed relative to a central axis of said burner port such that air is supplied to said burner port around said header;

plural gas nozzles arranged atop of and in communication with said header and equi-angularly arranged about said burner port central axis, each of said nozzles comprising a generally vertical conduit portion terminating in a head cover portion having a nozzle port such that gas is supplied to said burner port from said nozzle port along a direction generally defineable by a gas supply axis intersecting a plane perpendicular to said central axis at an angle, said gas supply axis being generally tangential to a circle contained within said plane and having a radius extending from said central axis to an apex of said angle; and

said head cover portion comprising a shield for the top of said conduit portion and said nozzle port, such that articles falling from said furnace are prevented from clogging said nozzle port;

whereby said gas is caused to flow helically and diffuse and mix with said air to provide a short flame.

4,392,816

WASTE GAS INCINERATOR

Elmer M. Berlie, and John D. Smart, both of Alberta, Canada, assignors to Western Research and Development, Calgary, Canada

Filed Mar. 2, 1981, Ser. No. 239,553
Int. Cl.³ F23D 13/20
U.S. Cl. 431—202 7 Claims

1. A waste gas incinerator comprising, an upright refractory lined, generally cylindrical casing, forming a combustion chamber and heat sink, having an open upper end and a lower end,

an upper wind shroud adjacent the open upper end and a lower wind shroud adjacent the lower end, both wind shrouds having a generally cylindrical shape with a larger diameter than the casing and a plurality of openings comprising vertical slots spaced around the wind shrouds,

air access at the lower end of the casing within the lower wind shroud, the access having a restriction means to limit air entry and cause turbulent air flow in the casing,

and waste gas entry to the casing.

4,392,817

WASTE GAS INCINERATOR WITH ADDED FUEL GAS

Elmer M. Berlie; John D. Smart, and Michael J. Zelensky, all of Alberta, Canada, assignors to Western Research & Development, Calgary, Canada

Filed Mar. 2, 1981, Ser. No. 239,554
Int. Cl.³ F23D 13/20
U.S. Cl. 431—202 9 Claims

1. A waste gas incinerator for burning waste gases with additional fuel gas, comprising

an upright refractory lined generally cylindrical casing forming a combustion chamber and heat sink, having an open upper end and a lower end,

an upper wind shroud adjacent the open upper end and a lower wind shroud adjacent the lower end, both wind shrouds having a generally cylindrical shape with a larger diameter than the casing and a plurality of openings comprising vertical slots spaced around the wind shrouds,

air access at the lower end of the casing within the lower wind shroud, the access having a restriction means to limit air entry and cause turbulent air flow in the casing,

fuel gas entry at the lower end of the casing,

waste gas supply system within the casing having preheating means for preheating the waste gases with combustion of fuel gas and air and having means for causing turbulence of the waste gases, and

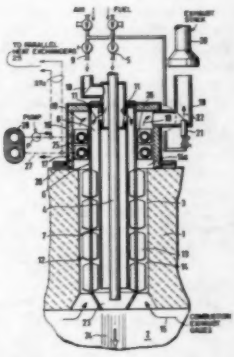
waste gas entry into the casing at a location where the fuel gas and air have commenced combustion.

4,392,818

MULTIPLE HEAT RECUPERATION BURNER SYSTEM AND METHOD

Joachim Wünning, Bergstrasse 20, D-7250 Leonberg 7, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,852
Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017618
Int. Cl.³ F23D 11/44
U.S. Cl. 431—215 13 Claims



3. Burner system having

a burner tube (4) adapted to receive a combustion fuel;

a first heat exchanger-recuperator (12) positioned to surround said burner tube and having an inlet air duct (8) and a combustion exhaust gas duct (14);

air inlet means (9, 10) furnishing combustion air to said inlet air duct and for supplying combustion air to the burner;

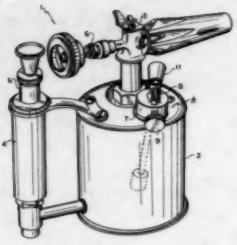
exhaust gas conduit means (18, 20) in flow communication with said combustion exhaust gas duct, said first heat exchanger-recuperator preheating air for combustion by the burner by heat exchange with exhaust gases,

and comprising an additional or auxiliary heat exchanger (25) positioned immediately adjacent to, and downstream of, said first heat exchanger-recuperator (12) to receive combustion exhaust gases from the combustion exhaust gas duct (14) of the first heat exchanger, said additional or auxiliary heat exchanger including means (26) in form of a ring-shaped structure (26), concentric with said first heat exchanger-recuperator (12) for confining a heat carrier medium and for cooling the exhaust gases flowing past said additional or auxiliary heat exchanger (25) prior to entry into the exhaust gas conduit means to a predetermined exhaust temperature.

4,392,819
PRELIMINARY HEATING APPARATUS FOR TORCH LAMP

Byorg R. Ahn, Room 706, Daekyo Apt.-1,1-892 Yoido-Dong, Seoul, Rep. of Korea

Filed Jan. 26, 1981, Ser. No. 228,522
Claims priority, application Rep. of Korea, Feb. 22, 1980, 1083/80[U]
Int. Cl.³ F23D 11/44
U.S. Cl. 431—231 1 Claim



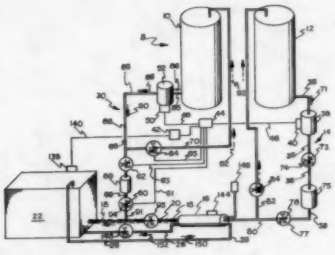
1. Torch lamp comprising a fuel container for receiving fuel therein, evaporation means mounted on the outside of said fuel container and receiving fuel from said fuel container, a fuel valve connected to said evaporation means for controlling the fuel passing through said evaporation means, a compressor mounted on the outside of said fuel container for supplying compressed air to said fuel container, whereby compressed air in said fuel container is operable to force the fuel in said fuel container out through said evaporation means, said compressor having an elongated section functioning as a handle for handling the torch, a pouring hole in said fuel container for supplying fuel to said fuel container, preliminary heating means removably mounted in said pouring hole, said preliminary heating means being positioned for heating said evaporating means prior to operating the lamp to evaporate fuel, said preliminary heating means comprising a body disposed in said pouring hole, a supply pipe connected at one end to said body and extending downwardly therefrom into said fuel container, said supply pipe having at least one bottom orifice opening into the inside of said fuel container for receiving fuel from the inside of said fuel container and at least one upper orifice opening into the inside of said fuel container for receiving compressed air from the inside of said fuel container, said preliminary heating means further comprising an adjusting valve for regulating fuel and air through said supply pipe, a spouting pipe connected to said body and having an opening adjacent to said evaporation means so that when said adjusting valve is opened, fuel under pressure flows from said bottom orifice located in said fuel container and compressed air under pressure flows from said upper orifice located in said fuel container into said supply pipe to said body and thence through said open adjusting valve to exit through said spouting pipe, and ignition means mounted on said body for igniting the fuel at the spouting pipe such that burning fuel from said spouting pipe thereby heats the evaporating means until the evaporating means is sufficiently heated to support combustion of fuel supplied by way of said fuel valve.

4,392,820
PROCESS AND APPARATUS FOR UTILIZING WASTE OIL

Werner G. Niederholtmeyer, 7804 Fritz Rd., Fort Wayne, Ind. 46802

Filed Dec. 29, 1980, Ser. No. 220,827
Int. Cl.³ F23G 5/12
U.S. Cl. 431—284 7 Claims

1. An apparatus for burning a combination of conventional heating oil and refuse oil, comprising storage means for the conventional heating oil and storage means for the refuse oil, a burning chamber having a burning nozzle, passage means leading from the respective storage means to said burning nozzle, means for initially injecting conventional heating oil through said burner nozzle to effect a temperature of a predetermined value, means for conveying at least some heat to the refuse oil preliminary to its injection through said burning nozzle whereby the refuse oil is readily combustible upon ejection through said burning nozzle, means for maintaining each of said storage means in sealed relation from the other, notwithstanding the separated schedule of fuel flow from the respective storage means to said burning nozzle whereby no waste oil is permitted to enter the conventional heating oil storage means nor is conventional heating oil permitted to flow into the waste oil storage means; a timer means adapted to provide initial heating by providing a supply from said conventional heating oil storage means solely, means for thereafter discontinuing said supply and providing for a flow only from said refuse oil storage means whereby during the initial heat-up time of the burning chamber there is utilized fuel from the conventional heating oil storage means and thereafter from the refuse oil storage means which serves as the primary fuel medium; remotely controlled solenoid operative valves in the passage means from at least one of said storage means, means for effecting the opening and closing of said solenoid operative valves whereby supply of oil to said nozzle is effective from only one of said storage means; a supply pump in each of the passage means for said conventional heating oil and refuse oil respectively, a motor associated with each of said pumps, and additional control valve means responsive to said timer for effectively isolating the respective storage means one from the other to prevent admixture of said oils in the respective means.



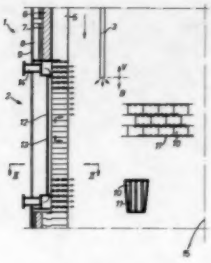
4,392,821
CALCINING FURNACE WITH GAS-PERMEABLE WALL STRUCTURE

Erwin Fiissl, Zurich, and Norbert Berger, Thalwil, both of Switzerland, assignors to Maerz Ofenbau AG, Zurich, Switzerland

Filed Oct. 5, 1981, Ser. No. 308,561
Claims priority, application Switzerland, Oct. 14, 1980, 7665/80
Int. Cl.³ F27D 1/08; F27B 3/24; F23M 5/02
U.S. Cl. 432—96 4 Claims

1. A regenerative shaft kiln for burning limestone or similar raw materials comprising: wall means formed of refractory material defining a kiln interior; burner means including at least one burner located in said kiln interior, said at least one burner having a burner opening arranged within said kiln at a distance from said wall means; an outer metallic shell surrounding said wall means on the outer side thereof and spaced therefrom in order to define an annular gap between said outer metalic shell and said wall means; and means for supplying a compressed gaseous medium into said gap between said outer metallic shell and said wall means; said wall means consisting essentially of refractory bricks having formed therein grooves in at least one lateral wall of said bricks, said grooves being formed to extend from an outer side of said bricks to an inner side thereof in

order thereby to form said wall means to be gas-permeable at least in the region of said burner opening, said grooves being thus formed to extend completely through said wall means in



flow communication between said gap and the interior of said furnace thereby effecting flow of said compressed gaseous medium therethrough.

4,392,822

SYSTEM FOR BURNING FINE-GRAINED MATERIAL, PARTICULARLY FOR THE MANUFACTURE OF CEMENT CLINKERS

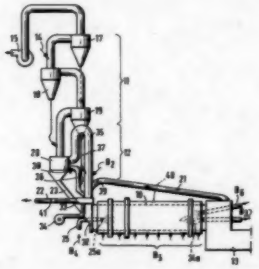
Kunibert Brachthäuser, Bergisch Gladbach, and Horst Herchenbach, Troisdorf, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Division of Ser. No. 63,102, Aug. 2, 1979, Pat. No. 4,298,393. This application Jun. 1, 1981, Ser. No. 268,810

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833744

Int. Cl.³ F27B *7/02*; **F27D** *11/00*; **H05B** *11/00*; **F27B** *7/36*

U.S. Cl. 432—106 **9 Claims**



1. In an apparatus for manufacturing calcined mineral products such as cement clinker from raw meal comprising a system including a raw meal preheater, a calciner, a rotary tubular kiln, and a clinker cooler in sequence, the improvement which comprises:

means for introducing a fossil fuel into said rotary kiln in an amount substantially less than the overall thermal energy supplied to said system,

heat generator means acting on the contents of said kiln and producing no exhaust gases therein, and

a bypass line connected to said rotary kiln to withdraw exhaust gases from said kiln created by the combustion of said fossil fuel.

4,392,823

METHOD AND APPARATUS FOR INDIRECTLY DRYING AND PREHEATING FINE MATERIAL

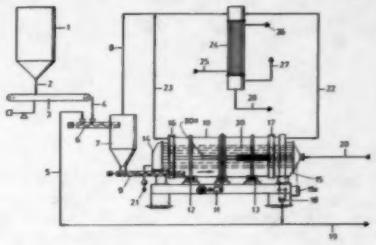
Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen, and Horst Dungs, Herne, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,496

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034952; Feb. 27, 1981, 3107407

Int. Cl.³ F27B *7/10*

U.S. Cl. 432—114 **18 Claims**



1. An apparatus for drying and preheating fine material, comprising:

an outer rotary drum defining a space therein;

drum drive means connected to said rotary drum for rotating said rotary drum;

a plurality of heating tubes extending through and closed with respect to the space of said rotary drum, a pair of heads connected to opposite ends of said rotary drum for rotatably receiving said rotary drum with said heating tubes connected between said pair of heads;

feed means connected at one end of said rotary drum for supplying moist fine material to said rotary dum;

discharge means at an opposite end of said rotary drum for the removal of dried and preheated fine material from said rotary drum;

vapor takeoff means connected to said rotary drum the top and at both opposite ends of said rotary drum for removing vapor, from the moist material, out of said rotary drum; and

a return line connected between said discharge means and said feed means, at a location outside said rotary drum space, for recycling a portion of the preheated and dried find material to said rotary drum with said moist fine material.

4,392,824

SYSTEM FOR IMPROVING THE FLOW OF GASES TO A COMBUSTION CHAMBER OF A COKE OVEN OR THE LIKE

Carl-Heinz Struck, Bochum, and Ralf Schumacher, Hagen, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,152

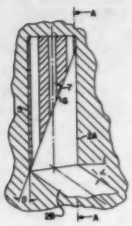
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037950

Int. Cl.³ F27D *17/00*; **C10B** *1/06*

U.S. Cl. 432—180 **14 Claims**

1. An industrial gas-fired system such as a coke oven, said system including a heating flue and ducts having a vertical portion and an obliquely-rising duct portion for conducting a flow of combustion gases into said heating flue, recuperative waste-heat recovery means receiving waste gases for preheating said combustion gases which comprise air when heating by combustion of rich gas and comprise air and lean gas when heating by combustion of lean gas, said combustion gases being introduced through said ducts from outlets of said waste-heat

recovery means into a heating flue, said system including the combination therewith of wedge-shaped refractory bricks each having at least one oblique surface, each brick being supported within a vertical portion of a duct and having vertical bores, the vertical portion of each duct having an increased diameter and extending to the base of the flue, each brick having a



rectangular cross section with vertical sides abutting the inner walls of the duct so that the said oblique surface extends at the bottom of the brick toward the mouth of the obliquely-rising duct portion, the sum of the cross-sectional areas of said cylindrical bores being within the range of 0.75 to 1.5 times the cross section of the gas-flow portion of the obliquely-rising duct portion.

4,392,825

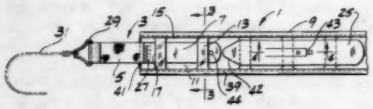
STRAPPING

Irvin S. DeWoskin, St. Louis County, Mo., assignor to Orthoband Company, Inc., Barnhart, Mo.

Filed Nov. 23, 1981, Ser. No. 323,673

Int. Cl.³ A61C 7/00

U.S. Cl. 433—5 **27 Claims**



1. Strapping having:

tensioning means comprising a first strap adapted to be pulled for developing a tension force;

a second substantially nonstretchable strap including an inner strip and an outer strip on one face constituting the outside face of the inner strip, said outer strip having openings therein spaced at intervals longitudinally of the strip and extending between the side edges of the strip; and

cooperable fastening means on the first strap and on the outside face of the inner strip of the second strap,

said first strap being adapted to be inserted between the inner and outer strips of the second strap and pulled to develop the desired tension force, said cooperable fastening means comprising a multiplicity of fastening elements projecting from either the first strap or the inner strip of the second strap, the other having a plush-like surface for interengagement with said fastening elements thereby to secure the first and second straps together with said tensioning means applying said tension force,

said fastening elements and plush-like surface being adapted to be held apart as the first strap is inserted between the inner and outer strips of the second strap by an elongate blade inserted between the first strap and the inner strip of the second strap, said blade being removable to permit interengagement of said fastening elements and said plush-like surface for securing the first and second straps together, the outer strip of the second strap at least partially covering the first strap to ensure that said interengagement is maintained.

4,392,826

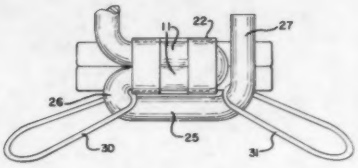
PALATAL ARCH BAR WITH COMBINATION LOCKING DEVICE AND ELASTIC ANCHOR

Robert A. Goshgarian, 2634 Grand Ave., Waukegan, Ill. 60085

Filed Feb. 16, 1982, Ser. No. 348,676

Int. Cl.³ A61C 7/00

U.S. Cl. 433—7 **5 Claims**



1. In an orthodontic appliance for applying rotating, expanding, contracting, intruding, and/or torquing forces to a pair of opposed molars in the upper arch of a person, wherein the appliance includes lingual tubes mounted lingually on said molars with mesiodistally extending openings therethrough, and a palatal arch bar having doubled-over ends received mesially by said lingual tubes, the improvement being in means for locking the arch bar to the lingual tubes, which locking means includes a U-shaped locking bar extending from each of the doubled-over ends and over the distal ends of the lingual tubes to prevent removal of said ends from the tubes.

4,392,827

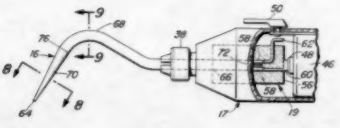
SELF-CONTAINED ROOT CANAL HEATED CONDENSER DENTAL INSTRUMENT

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20910

Filed Nov. 4, 1981, Ser. No. 318,069

Int. Cl.³ A61C 3/00

U.S. Cl. 433—32 **8 Claims**



1. A self-contained root canal heated condenser dental instrument, comprising:

a handle means, said handle means being hollow, said hollow handle means having an aperture at one end and being open at the opposite end, said handle means having a removable closure means for said open end;

a power source means, said power source means being affixed inside said hollow handle means;

a dental tool means, said dental tool means being used for filling root canal cavities, said dental tool means having a first end and a second end thereof, said first end being tapered, flexible, and having a memory, said first end being capable of spreading and condensing root canal filling material, said dental tool means being capable of being heated in order to heat said root canal filling material to cause it to be workable, said dental tool means being heated by a heating element means, said heating element means being folded upon itself to form a return loop configuration of two legs, said heating element means at the apex of said return loop being further configured into said taper;

an insulating means, said insulating means being located and placed within said dental tool means and between said two legs of said return loop, said insulating means insulating each said leg electrically from the other leg;

a coating material, said coating material being applied on said tapered portion of said heating element, said coating material preventing said root canal filling material from adhering thereto;

a heat transmission means, said heat transmission means being affixed inside said hollow handle means adjacent to said aperture therein, said heat transmission means being electrically connected to said power source means, said dental tool means having said second end thereof inserted through said aperture in said handle means and into said heat transmission means, said heat transmission means drawing power from said power source means and in turn heating said first end of said dental tool means through said heating element means.

4,392,828

METHOD FOR RESTORING A TOOTH

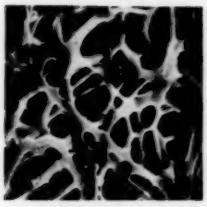
Lars E. M. Ehrnford, 31 Sanekullavagen, 217 14 Malmo, Sweden

Continuation of Ser. No. 777,909, Mar. 15, 1977, abandoned. This application Jan. 21, 1981, Ser. No. 226,636

Claims priority, application Sweden, Mar. 16, 1976, 7603313

Int. Cl.³ A61K 6/08

U.S. Cl. 433—217 1 Claim



1. A method of restoring a tooth which comprises applying thereto a dental composite comprising a particulate glass filler comprising a rigid and porous three-dimensional network of glass fibers produced by fusing together by heating the fibers having a diameter of less than 4 microns at a temperature sufficient to cause melting and complete fusion of substantially all of the individual glass fibers at their points of contact, the porosity of which is substantially continuous throughout the network, and mixed in an organic hardening resin; and allowing sufficient time for the hardening thereof.

4,392,829

METAL-PORCELAIN DENTAL RESTORATION AND METHOD OF MAKING

Asami Tanaka, 9307 North Lavergne, Skokie, Ill. 60077

Filed Mar. 31, 1981, Ser. No. 249,682

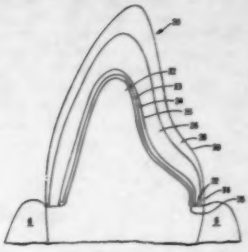
Int. Cl.³ A61C 5/08, 5/10

U.S. Cl. 433—222 15 Claims

1. A baked metal-porcelain dental restoration for mounting on a patient's shaped tooth base said restoration comprising:

(a) an interior substrate of non-cast semi-precious alloy of soft, swageable thin metal foil for mounting on the shaped tooth base, said substrate having a textured exterior surface substantially free from surface coatings and an interior surface configuration that conforms substantially to the exterior configuration of said tooth base; and

(b) a body porcelain layer chemically bonded directly to the substrate textured exterior surface without any intermediate interface composition therebetween, said porcelain



layer having an exterior of prescribed configuration to provide a desired occlusal surface.

4,392,830

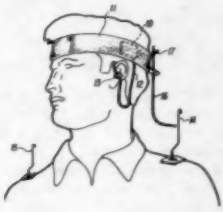
BODY COORDINATION TRAINING AID

Norman Salzman, 10508 Gainsborough Rd., Potomac, Md. 20854, and Edward Wellner, 4028 Hunt Rd., Fairfax, Va. 22031

Filed Oct. 27, 1981, Ser. No. 315,496

Int. Cl.³ A63B 69/36

U.S. Cl. 434—258 11 Claims



1. A body coordination training aid, comprising:

an audio oscillator;

a power source for said audio oscillator;

a first electrode;

a second electrode;

said first and second electrodes configured to make electrical contact when said user's head and shoulder are in a predetermined relative orientation;

means to electrically contact said audio oscillator to said power source via said first and second electrodes;

a mounting means for adjustably holding said first electrode and adapted to be mounted to the user's head; and

a rigid, flexible, non-conducting mounting strip for supporting said mounting means, said audio oscillator, and said power source.

4,392,831

ORRERY

Fritz Schubert, 1144 Trevor Dr., Lakeview Heights, Kelowna, British Columbia, Canada (V1Z 2J8)

Filed Sep. 14, 1981, Ser. No. 301,781

Int. Cl.³ G09B 27/02

U.S. Cl. 434—291 7 Claims

1. An orrery comprising:

(a) a frame;

(b) a plurality of concentric hollow tubes rotatably mounted on said frame, each having first and second ends, the first and second ends of each of said tubes extending axially

beyond first and second ends respectively of its outwardly adjacent tube;

(c) a plurality of supports connected at inner ends thereof to the first end of respective tubes, so as to extend radially outward therefrom a distance increasing from said support connected to the innermost of said tubes to said support connected to the outermost of said tubes;

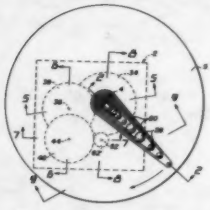
(d) a plurality of planetary representations representing a plurality of inner planets and a plurality of outer planets connected to respective supports remote from said tubes so as to be rotated about said tubes when said tubes are rotated;

(e) first set of circular gears connected to the second end of respective ones of said tubes which rotate planetary representations of inner planets;

(f) a second set of circular gears connected to the second end of respective ones of said tubes which rotate planetary representations of outer planets;

(g) first and second spaced apart axles mounted on said frame parallel to said tubes;

(h) third and fourth sets of circular gears rotatably mounted on said first axle, each gear of said third set being adjacent



and connected to a corresponding gear of the fourth set so as to rotate the latter when the former is rotated, and each gear of the fourth set engaging a corresponding gear of the second set of gears;

(i) fifth and sixth sets of circular gears rotatably mounted on said second axle, each gear of said fifth set being adjacent and connected to a corresponding one of the sixth set of gears so as to rotate the latter when the former is rotated, and each gear of the sixth set engaging a corresponding one of said third set of gears;

(j) a third axle rotatably mounted on said frame parallel to said tubes;

(k) seventh and eighth sets of circular gears mounted on said third axle to rotate therewith, each gear of said seventh set of gears engaging a corresponding one of said first set of gears, and each gear of said eighth set of gears engaging a corresponding one of said fifth set of gears;

(l) means connected to said third axle for rotating said third axle;

each gear in said sets of gears being dimensioned so as to rotate said tubes at relative rotational velocities corresponding to the relative rotational velocities of the planets represented by the planetary representations.

4,392,832

STEERING AND PROPULSION SYSTEM FOR MARINE USE

Carl E. Moberg, P.O. Box 1828, Seattle, Wash. 98111

Filed Jun. 22, 1981, Ser. No. 276,075
Int. Cl.³ B63H *23/02, 3/08*
U.S. Cl. 440—49 **10 Claims**

1. A marine propulsion device comprising:

prime mover drive means,

marine propeller means, and

means for supplying power to said propeller means in selectively variable amounts, including: a differential gearing unit including a power input drive shaft drivingly connected to said drive means, oppositely extending output driven shafts, gear means for differentially driving said output shafts from said power input shaft, and means for drivingly connecting said propeller means to one of said output shafts; and

brake means for selectively applying braking pressure to the other of said output shafts,

whereby power to said propeller means will be applied in direct proportion to the braking pressure applied by said brake means.

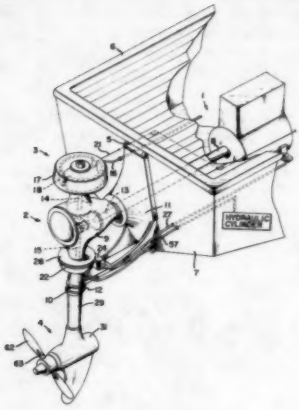
8. An adjustable pitch propeller comprising:

a rotatable propeller shaft;

drive means to rotate the propeller shaft;

means for lubricating the drive means with a lubricating fluid;

propeller blade means;



means for mounting said propeller blade means on said propeller shaft for rotation therewith, said mounting means including means forming a fluid pressure cylinder therein;

said propeller blade means including piston means affixed thereto and located in said cylinder,

a source of selectively variable fluid pressure acting on said piston means comprising

a bore in the propeller shaft in fluid communication with the cylinder and with the lubricating means, and

means to selectively pressurize the lubricating fluid; and

cam and follower means acting between said piston means and said fluid pressure cylinder for rotating said piston relative to said cylinder during linear displacement thereof.

4,392,833

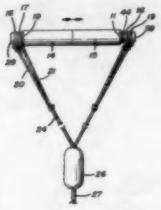
COMBINED SINGLE AND DOUBLE WATER SKI TOW BAR

Gary N. Hayden, 5479 Mill Creek Blvd., Youngstown, Ohio 44512

Filed Aug. 20, 1981, Ser. No. 294,480
Int. Cl.³ A63C *15/06*
U.S. Cl. 441—69 **1 Claim**

1. An improvement in a water ski tow device comprising a tow rope for attachment at one end to a towing boat, said tow rope having four separate sections at its opposite end and a tow bar for a skier attached to said four sections of the tow rope, said tow bar comprising a pair of elongated body members, each having first and second ends, means on said first ends detachably joined to one another so as to position said elongated body members in end to end assembled relation, detachable members on the outer opposite second ends of said elon-

gated body members, said improvement comprising means attaching said four end sections of said tow rope to said elongated body members and said detachable members respectively, said means comprising two of said four sections of said tow rope being attached to said detachable members and two of said four sections of said tow rope being attached to said



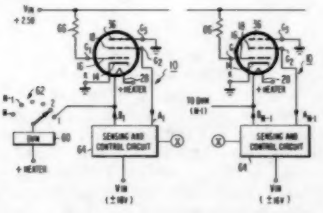
outer opposite second ends of said elongated body members adjacent said detachable members, said detachable members when detached from said outer opposite second ends of said elongated body members being engagable with said means on said first ends of said elongated body members whereby two tow bars, each having two of said four sections of said tow rope attached to its ends may be formed from said tow bar.

4,392,834

METHOD FOR AGING A CATHODE OF A CATHODE-RAY TUBE

Edgar M. Smith, Millersville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1981, Ser. No. 265,772
Int. Cl.³ H01J 9/44
U.S. Cl. 445—6 **2 Claims**



1. A method of aging a cathode of an evacuated cathode-ray tube having an electron gun for generating at least one electron beam, said electron gun including a heater, a cathode, a control electrode, a screen electrode and a focus electrode, said method comprising the steps of:

interconnecting said cathode and said focus electrode,

applying a first potential to said heater,

applying a second potential to said cathode and said focus electrode,

applying a third potential, more positive than said second potential, to said control electrode,

applying a fourth potential to said screen electrode,

sensing a change in said fourth potential,

generating a control signal from said sensed change in said fourth potential,

using said control signal to vary said first potential to said heater, and

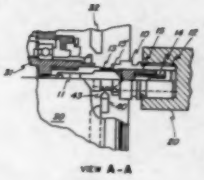
terminating said aging process when said control signal causes a predetermined value of said first potential to be achieved.

4,392,835

SLICER DISCONNECT

Ehtisham U. A. Siddiqui; James L. Wenzel, and John L. Butterfield, all of Erie, Pa., assignors to General Electric Company, Burlington, Vt.

Filed Feb. 27, 1981, Ser. No. 239,017
Int. Cl.³ F16D 9/00
U.S. Cl. 464—32 **6 Claims**



1. A shaft quick disconnect mechanism for intercoupling a high-speed driving shaft and a driven shaft, comprising:

a coupling shaft having an axis of rotation and its one end fixed against torsional relative movement with said driving shaft and its other end fixed against torsional relative movement with said driven shaft, and having a tubular intermediate portion of thin annular cross-section;

means for severing said coupling shaft at said intermediate portion thereof including:

slicing means having an edge portion and having a first disposition whereat said edge portion is spaced from said tubular intermediate portion and a second disposition whereat said edge portion is in tangential abutment with the periphery of said tubular intermediate portion;

detent means having a first disposition whereat it engages said slicing means and retains said slicing means in its first, spaced disposition and a second disposition whereat it is disengaged from said slicing means;

biasing means coupled to said slicing means for translating said slicing means, effective after said detent means has moved from its first, engaged disposition to its second, disengaged disposition, from said first, spaced disposition to said second, tangential abutment disposition, whereat said edge portion is in biased engagement with said tubular intermediate portion and as said driving shaft turns said coupling shaft said edge portion rubs against said tubular intermediate portion to provide a frictional force which provides localized heating of said tubular intermediate portion to cause plastic deformation and rupture of said tubular intermediate portion.

4,392,836

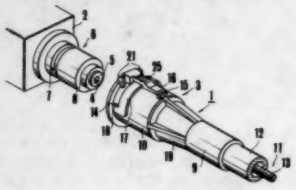
DEVICE FOR CONNECTING SPEEDOMETER TO FLEXIBLE SHAFT

Noboru Sugawara, Ageo, Japan, assignor to Kanto Seiki Co., Ltd., Saitama, Japan

Filed May 19, 1981, Ser. No. 265,160
Claims priority, application Japan, May 21, 1980, 55-69627[U]
Int. Cl.³ F16B 21/00; F16C 1/06; F16D 1/00
U.S. Cl. 464—52 **3 Claims**

1. An assembly comprising a speedometer, a flexible shaft, and a device for connecting said flexible shaft to said speedometer, said speedometer including an axially extending stem with an outer circumferential surface, an annular groove formed in and extending around said circumferential surface, a rotating shaft extending through said stem, said flexible shaft includes an axially extending inner shaft, said inner shaft is coupled to and rotates said rotating shaft, said device comprises a connecting tube formed of a synthetic resin, said connecting tube includes a front tube part positioned around said stem, said front tube part having a pair of diametrically opposite piercing

holes, a rear tube part positioned around said flexible shaft, said front tube part having a larger diameter than said rear tube part, and a tapered tube part extending between and interconnecting said front and rear tube parts with the axes of said front, tapered, and rear tube parts disposed in axial alignment, a lever formed integrally with said connecting tube at the location of the connection of said tapered tube part to said front tube part, said lever connected to said connecting tube by a thin walled hinge part and said lever being pivotally displaceable between a first position standing upwardly from said connecting tube and a second position pivoted downwardly toward and extending in the axial direction of said front tube part, a U-shaped arm extending transversely of and formed



integrally with said lever at a location between the opposite ends of said arm, the opposite ends of said U-shaped arm being elastically deformable toward and away from one another, each of said opposite ends has a claw extending toward said claw on the other said opposite end, said U-shaped arm is dimensioned to fit around said front tube part and is displaceable with said lever from the first position where it is spaced from said front tube part into the second position where it fits partly around the outside surface of said front part and initially said claws deform outwardly away from one another and then said claws engage into said piercing holes with the inner ends of said claws engaging into said annular groove formed in the circumferential surface of said stem when said front tube part fits over said stem.

4,392,837

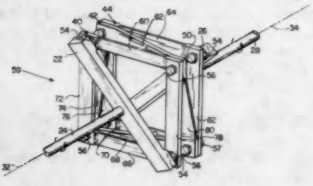
ROTARY DRIVE COUPLING

Charles J. Wirth, West Granby, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Filed Nov. 14, 1980, Ser. No. 206,695

Int. Cl.³ F16D *3/62*

U.S. Cl. 464—69 **6 Claims**



1. A flexible coupling for use in applications wherein more torque is to be transmitted in one direction of rotation than the other, said coupling comprising a driving member rotatable about a first axis, a driven member rotatable about a second axis generally colinear with said first axis, and a flex member located substantially in a plane generally perpendicular to said first and second axes, said flex member consisting of a first pair and a second pair of elongated flex elements all of which elements are of generally rectangular cross-section throughout the major portion of their lengths, each of said elements having two ends and each element of each of said pairs being of substantially the same length and cross-section as the other element of its pair, the two elements of said first pair having a thickness substantially different from that of the two said elements of said second pair, each end of each of said elements being fixedly joined to an end of an element from the other of said pairs so that said elements form a unitary rectangular arrangement with the two elements of each of said pairs located on opposite sides thereof, said flex member having corners which are the corners of said rectangular arrangement, means fixing said driving member to diagonally opposite ones of said corners of said flex member, and means fixing said driven member to the remaining diagonally opposite ones of said corners of said flex member, said flex member being connected to said driving and driven members in such manner that when said driving and driven members rotate and transmit torque in said one direction of rotation the thinner two of said flex elements are in tension and the thicker two of said flex elements are in compression.

4,392,838

SEALING BOOT FOR UNIVERSAL JOINT

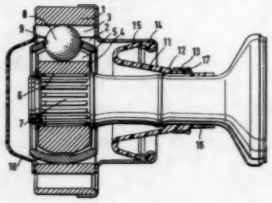
Hans-Heinrich Welschof, Rodenbach, and Karl Damian, Rodgau, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,444

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009639

Int. Cl.³ F16D *3/84*

U.S. Cl. 464—175 **8 Claims**



1. In a sealing boot for a universal joint including a pair of terminal portions each engaged, respectively, with different parts of said universal joint to provide a protective seal for said joint, the improvement wherein at least one of said terminal portions comprises annular collar means arranged in sealed engagement with one of said different respective parts of said joint, channel means defined between said collar means and said one joint part for enabling fluid flow therethrough between the interior and exterior or joint portions sealed by said sealing boot and resilient check valve means located on one side of said channel means, said resilient check valve means being normally in sealing engagement with said one joint part to prevent fluid flow through said channel means with the level of fluid pressure within said channel means operating to resiliently release said resilient check valve means from said sealing engagement to enable fluid flow through said channel means.

4,392,839

DRIVE SHAFT CONSTRUCTION

Erich Aucktor, Offenbach am Main, Fed. Rep. of Germany, assignor to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,446

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009277

Int. Cl.³ F16C *3/00*

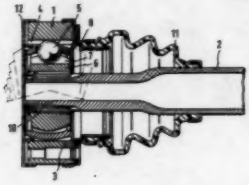
U.S. Cl. 464—183 **2 Claims**

1. In a drive shaft construction for transmitting power in an automotive vehicle including an integral hollow tubular shaft having a pair of end portions formed with a splined configura-

tion adapted for receiving driving joints, the improvement which comprises:

that said tubular shaft is formed with a portion intermediate said end portions having an outer diameter greater than the outer diameter of said end portions;

that the wall thickness of said intermediate portion is between ¼ and 1/15 of said outer diameter of said intermediate portion; and



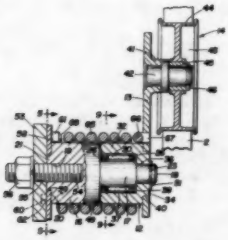
that said tubular shaft includes two transition portions extending respectively between said intermediate portion and each of said end portions, said transition portions being formed as stepped configurations each including at least two steps and each having a wall thickness which increases from said larger-diameter intermediate portion to said smaller-diameter end portions.

4,392,840

BELT TENSIONER

Mijo Radocaj, Massillon, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Jan. 12, 1981, Ser. No. 224,290
Int. Cl.³ F16H *7/00, 7/10*
U.S. Cl. 474—117 **11 Claims**



1. An improved belt tensioner construction for tensioning an endless drive belt of the drive system for vehicle accessories, said construction including:

(a) shaft means adapted to be mounted in a fixed position adjacent the drive belt;

(b) pulley means movably mounted with respect to the shaft means and movable in a belt tensioning direction for tensioning engagement with the drive belt;

(c) torsional spring means telescopically mounted on the shaft means for biasing the pulley means in the belt tensioning direction; and

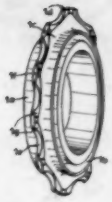
(d) clutch means telescopically mounted on the shaft means within the torsional spring means and operatively engaged with the pulley means and the shaft means for permitting movement of the pulley means in the belt tensioning direction and for restraining movement of the pulley means in a direction opposite to the belt tensioning direction.

4,392,841

GUIDE SPROCKET WHEEL, MORE PARTICULARLY FOR THE GEAR SHIFT DEVICES OF BICYCLES AND THE LIKE

Henri Juy, Dijon, France, assignor to Le Simplex, France

Filed Jun. 20, 1980, Ser. No. 161,399
Claims priority, application France, Jun. 26, 1979, 79 17272
Int. Cl.³ F16H *55/30, 11/08*; B62M *9/12*
U.S. Cl. 474—156 **7 Claims**



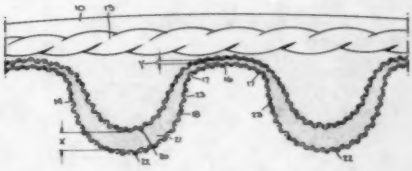
1. A guide sprocket wheel adapted for engagement with the rolls of a chain, comprising a plurality of teeth corresponding to the pitch of the chain to be engaged, the tops of the teeth being chamfered or bevelled on the periphery and on the lateral faces of the wheel; wherein on the lateral faces of the wheel, the angles formed on the tops of the teeth and on the side of the recesses between the teeth are cut off by further bevels around the profile of the teeth, gradually reducing the thickness of the teeth from the base to the tops thereof; the bevels extending between a central peripheral bevel to the bottom of the recesses between two successive teeth such that the thickness of the wheel is not modified at the bottom of the recesses of the teeth.

4,392,842

TOOTHED POSITIVE DRIVE POWER TRANSMISSION BELT WITH A FABRIC REINFORCEMENT SUSPENDED WITHIN THE BELT TEETH

William A. Skura, Naugatuck, and Thaddeus F. Cathey, Woodbury, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

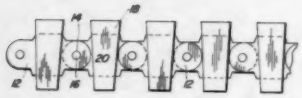
Filed Oct. 10, 1980, Ser. No. 195,725
Int. Cl.³ F16G *1/28*
U.S. Cl. 474—205 **13 Claims**



1. A positive drive belt for operation with toothed pulleys comprising an elastomeric body, a reinforcing tensile member imbedded in said body, teeth on at least one surface of said body said teeth having tip regions spaced from said reinforcing member and said teeth separated by land areas, a flexible covering on the outer surface of the belt teeth and land areas and a curvilinear shaped suspended reinforcing means within each tooth separated from the outer surface of the tooth and from the outer surface of the land areas by a curvilinear shaped cushion layer of elastomeric material, said cushion layer having a thickness varying gradually between a first given thickness in the region of the land areas to a second substantially greater given thickness in the tip regions whereby the outer surface of the belt is free to flex as the belt engages its pulleys

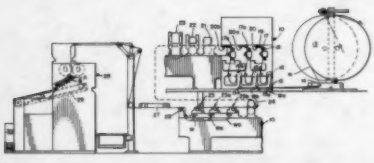
while the inner portion of the belt teeth are structurally reinforced against tooth shear.

4,392,843
METAL BELT
Geoffrey N. Smit, Rancho Palos Verdes, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 3, 1980, Ser. No. 212,300
Int. Cl.³ F16G 5/18
U.S. Cl. 474—245 5 Claims



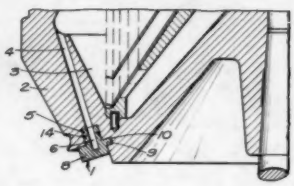
1. An endless metal chain belt adapted for use in connecting pulleys in a pulley drive system wherein each pulley is constructed of a pair of flanges, said belt comprising:
a plurality of sets of links, each set of which is interleaved with the next adjacent sets of links;
pivot means joining the next adjacent sets of links to form an endless chain and to permit articulation thereof; and
metal drive blocks, each having a central window bounded by a bottom, top and sides, and each surrounding a set of links;
each drive block means being located between and generally spaced from the next adjacent pivot means;
each drive block means being frictionally positioned and secured to its set of links.

4,392,844
METHOD AND APPARATUS FOR CORRECTING STACK LEAN IN A ZIG-ZAG FOLDED WEB
James B. Fulk, Saratoga, Calif.; Jerry L. McKeefry, Pulaski, Wis.; George F. Schuning, DePere, Wis., and John J. Bradley, Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.
Filed Jun. 22, 1981, Ser. No. 275,796
Int. Cl.³ B65H 45/16
U.S. Cl. 493—399 16 Claims



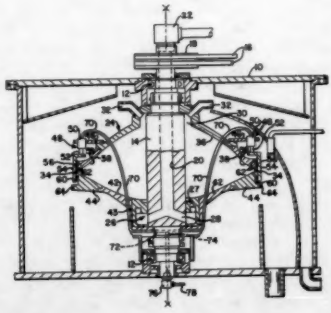
1. In a method for correcting stack lean in a zig-zag folded continuous web having selected longitudinally spaced lines of transverse perforation and a fold at each said selected line, the steps of feeding a web through a means for transversely perforating the web while the web is under tension, and applying a cyclically varying additional force to the web for the purpose of changing the longitudinal length between said selected lines as the web passes through the perforating means, the duration of said cycle of said force extending at least over the web length between three folds.

4,392,845
DISCHARGE NOZZLE FOR CENTRIFUGAL SEPARATOR DRUMS
Hubert Gunnewig, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany
Filed Nov. 25, 1981, Ser. No. 324,920
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103531
Int. Cl.³ B04B 1/10
U.S. Cl. 494—1 1 Claim



1. In a centrifugal separator drum with continuous discharge for the removal by centrifugal force of a concentrate from a peripheral portion of a separating chamber, having at least one discharge nozzle being disposed in an outer wall of the drum at a smaller drum diameter than that of the peripheral portion of the separating chamber, at least one discharge nozzle being rotatably inserted in the drum wall and sealed by a sealing ring and having an inlet orifice, a discharge orifice and a locking projection which engages a corresponding recess in the drum wall for the fastening of the discharge nozzle, the improvement wherein the discharge nozzle comprises an additional, eccentrically disposed projection opposite the locking projection for the limiting movement of the discharge nozzle in the drum wall and wherein the center of gravity of the discharge nozzle lies in this projection, whereby under the action of the centrifugal force when the drum is rotating the center of gravity establishes itself on a center-of-gravity axis extending radially from the drum axis and, wherein the discharge orifice is disposed at 90° from the center-of-gravity axis and opposite the direction of drum rotation.

4,392,846
CENTRIFUGE APPARATUS
John Novoselac, Aurora, Colo., and Dale L. Churcher, Johannesburg, South Africa, assignors to Joy Manufacturing Company, Pittsburgh, Pa.
Filed May 18, 1981, Ser. No. 264,389
Int. Cl.³ B04B 1/10
U.S. Cl. 494—40 7 Claims



1. A centrifuge comprising:

an elongated shaft member rotatable about the longitudinal central axis thereof;

a bowl member having formed sections rigidly secured to axially spaced portions of said shaft member, respectively,

said formed sections extending radially outwardly of and circumferentially encompassing said central axis to form a chamber in conjunction with said shaft member,

said formed sections having a discharge opening of a fixed axial configuration between radially outer peripheral portions of said formed sections for discharging a centrifuged material,

means for introducing a slurry into said bowl member,

said bowl member having means for discharging an effluent constituent of said slurry,

a ring structure encompassing the radially outermost extent of said peripheral portions at least a portion of which includes a resilient member forming one side of the material flow path from said discharge opening,

actuator means having relatively movable parts with one of said parts being secured to one of said formed sections and the other of said parts being cooperable with the resilient portion of said ring structure to displace at least a portion of said ring structure with respect to said radially outermost extent, and

said actuator means being selectively and independently operable to move said other of said parts and displace at least said portion of said ring structure to selectively and independently open and close said discharge opening.

4,392,847

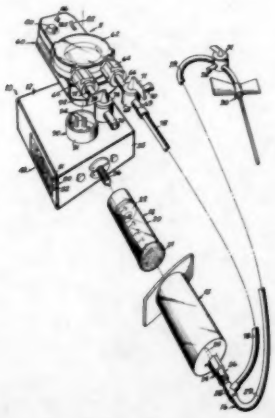
INJECTION AND MONITORING SYSTEM

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Continuation-in-part of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, and a continuation-in-part of Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,234, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672. This application May 6, 1981, Ser. No. 260,964

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—118 **9 Claims**



1. A system for injecting fluid into a patient and monitoring the blood pressure of the patient comprising:

injector means carrying the fluid to be injected, said injector defining a fluid outlet therefrom and including expelling means for alternatively and successively discharging fluid for injection out of said fluid outlet for a first prescribed period of time and stopping the discharge of fluid out of said fluid outlet for a second prescribed period of time, display means, and rate indicator means operatively associated with said expelling means for generating an output indicative of the rate of fluid injection connected to said display means for visually displaying the rate at which the fluid is being injected;

delivery tube means connected to said fluid outlet and adapted to be connected to the vascular system of the patient so that the fluid discharged from said fluid outlet will be injected into the vascular system of the patient;

a blood pressure monitor including transducer means having an inlet connected to said delivery tube means between said fluid outlet on said injector means and the patient so that said transducer means is in communication both with the vascular system of the patient through said delivery tube means and with said fluid outlet from said injector means for providing an output indicative of the pressure in said delivery tube means, said monitor further including pressure detector means responsive to the output of said transducer means to generate outputs indicative of the maximum and minimum pressures within said delivery tube means over a prescribed period of time; and

mounting means for selectively and removably mounting said blood pressure monitor on said injector means, said mounting means including connector means constructed and arranged so that, as an incident to the mounting of said monitor on said injector means, said connector means operatively connects the output of said pressure detector means in said blood pressure monitor to said display means in said injector means whereby said display means in said injector means automatically visually displays the output of said pressure detector means which is indicative of the maximum and minimum pressures in said delivery tube means so that, while the discharge of fluid from said fluid outlet in said injector means is stopped, the pressures in said delivery tube means and displayed on said display means is the patient's systolic and diastolic blood pressure.

4,392,848

CATHETERIZATION

Donald S. Lucas; Roger L. Stone, both of Fairfield, and Eugene R. Cooper, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 25, 1979, Ser. No. 51,477

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—53 **20 Claims**

1. A method for catheterization with lowered risk of nosocomial infection by achieving microbial inhibition at and around the placement site of catheters and the like used in the bodies of humans and lower animals, comprising: inserting into the body of a human or lower animal in need of such treatment a catheter, or the like, said catheter comprising: a liquid reservoir of antimicrobial agent; a delivery means for transporting liquid materials, said delivery means being in the form of a tube; at least part of the portion of said tube which contacts the body comprising a carboxylic acid-permeable polymer, said polymer being in contact with both the environment external to said catheter and with said reservoir of antimicrobial agent flowing within the lumen of said catheter; said reservoir of antimicrobial agent comprising an aqueous solution containing at least a minimum lethal concentration of a straight chain carboxylic acid or carboxylic acid salt having from 4 to 9 carbon atoms.

4,392,849

INFUSION PUMP CONTROLLER

John H. Petre, and Delos M. Cosgrove, both of Cleveland Hts., Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Jul. 27, 1981, Ser. No. 287,516

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—66 **19 Claims**

1. A medication introduction rate control system comprising:

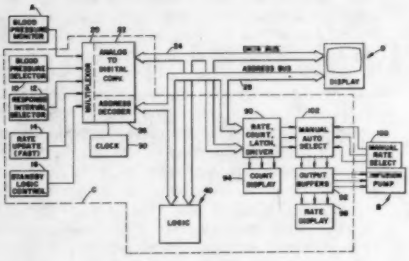
a blood pressure monitor for monitoring a patient's blood pressure;

an analog to digital converter operatively connected with the monitor for producing digital monitor signals which are indicative of the patient's blood pressure;

a computer means for deriving from the monitor signals a rate control signal which indicates a rate of medication introduction, the computer means being operatively connected with the analog to digital converter the computer means including:

comparing means for comparing the monitor signals with a preselected blood pressure level;

rate of change means for periodically determining a rate of change of the monitor signals; and



incremental rate selection means for adjusting the rate control signal in preselected increments which preselected increments are independent of a magnitude of a difference between the monitor signals and the preselected blood pressure level, the incremental rate selection means being operatively connected with the comparing means and the rate of change means, whereby the rate control signal is adjusted incrementally in response to the monitor signal and the preselected blood pressure level comparison and in response to the periodic rate of change determination;

a latch means for temporarily storing the rate control signal, the latch means being operatively connected with the computer means.

4,392,850

IN-LINE TRANSFER UNIT

Allen M. Elias, Mundelein, and Joseph N. Genese, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 23, 1981, Ser. No. 324,194
Int. Cl.³ A61J 1/00
U.S. Cl. 604—82 **16 Claims**

1. An in-line transfer unit for mixing a sterile fluid material from a first container into a second container with the contents of both containers to be subsequently delivered through said second container, said unit comprising;

a container having opposing passageways for storing a fluid material to be transferred;

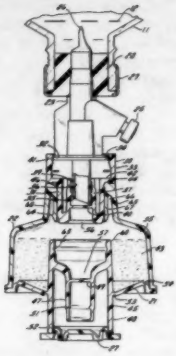
first and second closures sealing the passageways in said container, said closures defined in part by pierceable diaphragm portions;

a transfer member having a passage therethrough with a piercing end on one end and a diaphragm piercing portion on the other end;

retentive movement means operatively associated with said first closure and said transfer member to permit sufficient movement of said transfer member so that said piercing portion thereof can pierce said diaphragm of said first closure; and

a flexible end wall defining a portion of said second closure;

so that when the piercing end of the transfer member is in fluid communication with said first container, said diaphragm piercing portion can be moved to pierce said diaphragm portion of said second container and permit in part the intermixing of the material therein with the contents of said first container by an inward movement of said flexible end wall, and subsequently, the opposing diaphragm portion of said



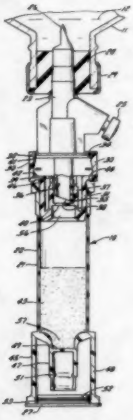
second closure will be pierced by another piercing member and the contents of both containers will flow through and out of said second container by means of said other piercing member.

4,392,851

IN-LINE TRANSFER UNIT

Allen M. Elias, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 23, 1981, Ser. No. 324,200
Int. Cl.³ A61J 1/00
U.S. Cl. 604—82 **14 Claims**



1. An in-line transfer unit for mixing a sterile fluid material from a first container into a second container with the contents of both containers to be subsequently delivered through said second container, said unit comprising;

a container having opposing passageways for storing a fluid material to be transferred;

first and second closures sealing the passageways in said container, said closures defined in part by pierceable diaphragm portions;

a transfer member having a passage therethrough with a piercing end on one end and a diaphragm piercing portion on the other end;

retentive movement means operatively associated with said first closure and said transfer member to permit sufficient movement of said transfer member so that said piercing portion thereof can pierce said diaphragm of said first closure;

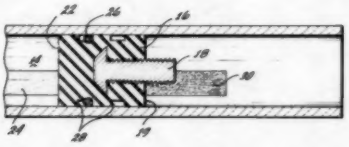
so that when the piercing end of the transfer member is in fluid communication with said first container, said diaphragm piercing portion can be moved to pierce said diaphragm portion of said second container and permit intermixing of the material therein with the contents of said first container, and subsequently, the opposing diaphragm portion of said second closure will be pierced by another piercing member and the contents of both containers will flow through and out of said second container by means of said other piercing member.

4,392,852

TAMPER-ALERTING HYPODERMIC SYRINGE

Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Filed Mar. 31, 1982, Ser. No. 363,926
Int. Cl.³ A61M 5/00
U.S. Cl. 604—111 **4 Claims**



1. An improvement for use in a hypodermic syringe of the type having a drive piston slidably mounted in a tubular member, said improvement comprising:

a piece of easily abradable material mounted on the drive piston for motion with the drive piston and urged radially outward by the drive piston against the inside surface of the tubular member; and,

a rough area on the inside surface of the tubular member in the form of a strip extending lengthwise of the tubular member, whereby as the drive piston is advanced within the tubular member said piece of easily abradable material rubs on said rough area causing particles of the easily abradable material to become securely lodged on said rough area where their presence provides a relatively permanent indication of the extent to which the drive piston has been advanced.

4,392,853

STERILE ASSEMBLY FOR PROTECTING AND FASTENING AN INDWELLING DEVICE

Rudolph Muto, 24 Williams St., Andover, Mass. 01810

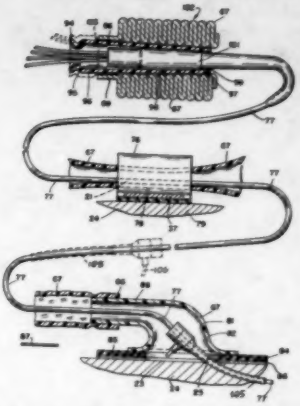
Filed Mar. 16, 1981, Ser. No. 244,000
Int. Cl.³ A61M 5/00, 25/02
U.S. Cl. 604—171 **11 Claims**

1. A sterile assembly for protecting an elongated indwelling device having a proximal end, for insertion in an incision in the human body, and a distal end, for connection to a medical device outside the human body, said assembly comprising:

an elongated, tubular sheath of sterile, impervious, limp, flexible, plastic substantially co-extensive in length with said indwelling device and having a proximal end and a distal end;

an elongated, bell shaped dome of self-supporting plastic sealingly affixed to the proximal end of said sheath: said dome being shaped and dimensioned to cover said incision and keep the incision and indwelling device free of contamination with air and having an annular base flange with a skin contacting surface covered by a layer of adhesive adapted to be affixed around said incision, said surface normally covered by a removable strippable sheet

and a hollow support tube of said self-supporting plastic, and of predetermined length, sealingly connected to the distal end



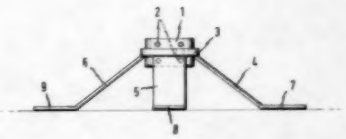
of said sheath, said tube having an axial bore which tapers from its outer end in a progressively reduced diameter to its inner end for slidably fitting and sealing the conventional nub on said indwelling device.

4,392,854

DEVICE FOR FIXING CATHETERS OR THE LIKE

Bernhard Ibach, Brüderstrasse 52, 5630 Remscheid, Fed. Rep. of Germany

Filed Nov. 28, 1980, Ser. No. 211,181
Int. Cl.³ A61M 5/00, 25/00
U.S. Cl. 604—174 **5 Claims**



1. A device for fixing catheters or the like on the surface of a body, comprising a curved plate having an axis of curvature adapted for alignment substantially normal to said body, said curved plate extending less than 180° about said axis of curvature; and a plurality of legs attached to said curved plate, each of said legs extending at an acute angle relative to said axis of curvature and each of said legs having a foot portion adapted for adhesion to said body and a raised portion attached to said curved plate, to support said curved plate at a spaced-apart position from said body.

4,392,855

CATHETER

Dimitrios G. Oreopoulos, 10 Ladywood Dr., Rexdale, Ontario, and Gabor Zellerman, 566-590 Richmond Street West, Toronto, Ontario, both of Canada

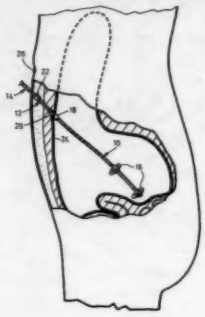
Filed Apr. 14, 1981, Ser. No. 253,948
Int. Cl.³ A61M 25/00
U.S. Cl. 604—175 **1 Claim**

1. A permanent peritoneal catheter of flexible tubing comprising a continuous flexible tube having a perforate peritoneum section, a subcutaneous section and an exterior section;

said peritoneum section having flexible locating discs of inert plastics material extending therefrom;

the peritoneum section having a circumferentially extending bead of inert material adjacent the subcutaneous section and a fibrous peritoneum cuff outwardly of and close to the bead;

said fibrous peritoneum cuff having a fibrous disc extending radially therefrom;



said fibrous peritoneum cuff and fibrous disc being close to said bead as aforesaid whereby to cooperate with said bead to hold a peritoneum membrane therebetween and form a seal at the peritoneum membrane in use;

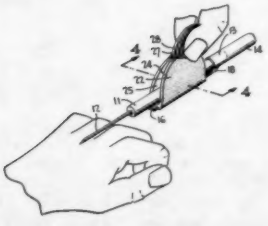
the subcutaneous section having means for sealing the catheter at the outer skin.

4,392,856

VASCULAR PUNCTURE STABILIZER FITTING FOR FACILITATING WITHDRAWAL

Joseph Lichtenstein, Colonia, N.J., assignor to Whitman Medical Corporation, Clark, N.J.

Filed Oct. 23, 1981, Ser. No. 314,481
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—177 **16 Claims**



1. A fitting for use in performing a vascular puncture by a blood vessel-entering element and for positionally stabilizing the blood vessel-entering element in situ after the vascular puncture, said fitting comprising:

a holder for said blood vessel-entering element, said holder including an elongate member having a longitudinal axis extending substantially parallel to said blood vessel-entering element;

a stabilizing member having top and bottom surfaces, a longitudinally-extending support region on said first surface, and first and second wing-like members extending in opposite direction transversely from said support region, said stabilizing member being flexible about said support region to define a first flexed position in which parts of the wing-like members at said top surface are brought into contact, said wing-like members normally residing in substantially co-planar relation when said stabilizing member is in an unflexed second position;

gripping means defined in said first position of said stabilizing member for securing said holder in contact with and extending along said support region to preclude all relative movement between said holder and said stabilizing member; and

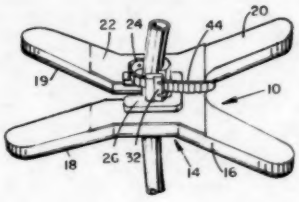
retaining means defined in said second position of said stabilizing member for retaining said holder in contact with and extending along said support region to preclude all relative movement between said holder and said stabilizing member except movement parallel to said longitudinal axis.

4,392,857

TUBE HOLDER

Anthony V. Beran, 1472 La Loma Dr., Santa Ana, Calif. 92705

Filed Apr. 23, 1981, Ser. No. 256,698
Int. Cl.³ A61M *25/02*
U.S. Cl. 604—179 **10 Claims**



1. A tube clamp comprising:

a clamp base including a lengthwise surface adapted to lie disposed against a section of the length of a tube;

a U-shaped strap retainer fixed to the base at one side of said lengthwise surface, the arms of the U-shape extending substantially parallel said surface;

a strap fixed at one end to said base at the other side of said lengthwise surface;

complementally formed conformations on at least one side of said strap and one arm of said U-shaped strap retainer, the separation of said arms being such that said strap may be inserted sidewise between the arms of the strap retainer when said conformations are aligned and may not be inserted endwise between the arms without retraction of one of said conformations;

the width of said strap being less than the length of at least one of said arms of the U-shaped strap retainer; and

a projection extending from one arm toward the other of said U-shaped strap retainer at a point near the upper end of said one arm, the degree of extension being such as to preclude sidewise insertion of the strap between said arms, and sidewise removal, unless the arms of the U-shaped strap retainer are separated beyond their separation in relaxed condition.

4,392,858

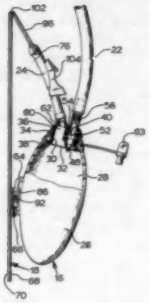
WOUND DRAINAGE DEVICE

Robert D. George, Lake St. Louis, and Georgio di Palma, St. Peters, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jul. 16, 1981, Ser. No. 283,702
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—187 **19 Claims**

1. A patient wound drainage device comprising manually operable wound suction pump means for connection with a catheter disposed adjacent a body wound of a patient for removing and collecting drainage liquid from the body wound, said pump means including a resilient, at least partially collapsible drainage receptacle, a pump inlet port connected to said

receptacle means for connection said pump inlet port to a catheter so that said receptacle can receive drainage liquid from the body wound, and a pump outlet port connected to said receptacle for discharging drainage liquid therefrom, said receptacle being hand squeezable and releasable for producing a suction force at said pump inlet port, a one-way valve connected in series with said pump inlet port to prevent drainage liquid flow from said receptacle to the catheter, a fluid drainage storage bag including a pair of pliable sheet material members in face-to-face relation forming the sidewalls of the bag, a



bag inlet port connected to the upper end portion of said bag, fluid connector means for connecting said pump outlet port with said bag inlet so that drainage liquid can be pumped from said receptacle into said bag by hand squeezing said receptacle, releasable connection means for connecting said receptacle to said bag in side-by-side relation with the sidewalls of said bag and receptacle in facing adjacent relation and with said receptacle between the upper and lower ends of said bag, and means for securing said bag, with said receptacle connected thereto, to the patient.

4,392,859

FITMENTS FOR INJECTION DEVICES

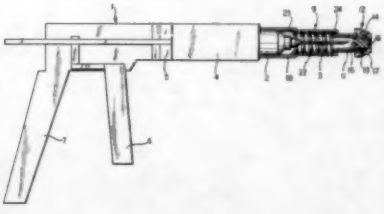
Hugh R. Dent, Malmesbury, England, assignor to Sterimatic Holdings Limited, Tortola, British Virgin Isls.

Filed Jul. 28, 1981, Ser. No. 287,775

Claims priority, application United Kingdom, Jul. 29, 1980, 8024765; Sep. 25, 1980, 8030985

Int. Cl.³ A61M 5/00

U.S. Cl. 604—198 **17 Claims**



1. A sterilizing fitment for an injection device of the kind in which injection liquid is delivered through a hollow needle, the fitment being provided to sterilize the needle prior to its application to the site of injection and again on withdrawal of the needle from the site of injection, which fitment comprises a collapsible sleeve comprising two telescoping tubes for surrounding the needle, means at one end of the sleeve on one of said tubes for attaching the sleeve to a needle support of the injection device, wall means at the other end of the sleeve on the other of said tubes closing off said other end so as to enclose the needle, and sterilizing means in the vicinity of said other end of the sleeve, the two ends of the collapsible sleeve being reciprocable relative to one another in the direction of the length of the needle and being resiliently biased in the extended position, whereby, in use, when an injection is effected by placing said other end of the sleeve against the injection site and applying pressure to the injection device in a direction towards the injection site, the point of the needle moves through the wall means and the sterilizing means into the injection site as the sleeve collapses under the applied pressure and subsequently moves back through the wall means and the sterilizing means as the sleeve reassumes its extended position on release of said pressure.

4,392,860

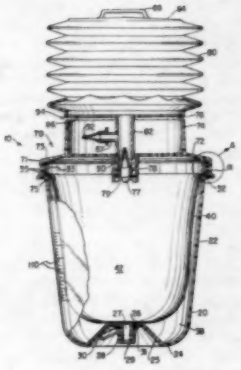
DISPOSABLE WOUND DRAINAGE DEVICE

Charles M. Huck, Oldwick; John E. Studer, Flemington, both of N.J., and Philip H. Sauer, Indian Rocks Beach, Fla., assignors to Howmedica, Inc., New York, N.Y.

Continuation of Ser. No. 2,610, Jan. 11, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,571

Int. Cl.³ A61M 1/00

U.S. Cl. 604—212 **14 Claims**



1. A device for removal of exudate from a wound comprising:

a. a housing having a first end and a second end, side walls and end walls at each of the first and the second ends, said housing defining a generally enclosed chamber, each end having an opening for communicating with said chamber;

b. a collapsible passive non-elastic member means expandable to its original extended state having a peripheral edge and being both airtight and watertight, said passive member means being disposed within the housing and sealingly connected at its periphery adjacent proximal to the second end of the housing so as to separate the interior of the housing chamber into a first chamber portion communicating with said first end wall opening and a second chamber portion communicating with said second end wall opening, said passive member means being configured and dimensioned such that when it is substantially expanded toward the first end wall it substantially conforms to the configuration of the inside of the side walls of the housing; and

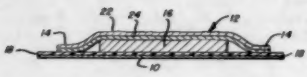
c. bellows means disposed outside of the walls of said housing and coupled to the second end wall opening for decreasing the pressure within said second chamber portion solely by said means so as to draw and collapse the passive member means toward the second end of the housing such that the volume of the first chamber portion is increased and a negative pressure is created therein.

4,392,861

TWO-PLY FIBROUS FACING MATERIAL

George A. M. Butterworth, Western Springs, and Frank J. Fillwalk, Oak Lawn, both of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Oct. 14, 1980, Ser. No. 196,809
Int. Cl.³ A61F 13/16; B32B 7/06, 21/02, 21/10
U.S. Cl. 604—366 27 Claims



1. A high loft, low density, nonwoven, fibrous two-ply facing material for an absorbent product such as a diaper which comprises a first outer layer of irregularly arranged intersecting, overlapping, mechanically interengaged, loosely assembled natural wood pulp fibers defining interstices therebetween, and a second inner layer of similarly disposed fibers in contact with said outer layer at an interface between said two layers, said inner layer including intermixed natural wood pulp fibers and thermoplastic synthetic wood pulp fibers, said synthetic wood pulp fibers having a length and denier generally similar to natural wood pulp fibers, said inner layer containing generally in the range of about 10 percent to about 30 percent by weight of synthetic wood pulp fibers and said synthetic wood pulp fibers being present at the boundary surface of said inner layer adjacent said interface in a quantity sufficient to occupy no more than about 6 percent of the area occupied by exposed fiber segments contained in said inner layer at its said boundary surface, said synthetic wood pulp fibers having a melting point lower than the melting point, or degradation temperature, of the other fibers in said two-ply facing material, fiber segments extending from either of said fibrous layers across said interface between the two layers and into the interstices between the fibers of the other layer being substantially limited to outer end portions of such fibers, said synthetic wood pulp fibers in said inner layer having been heat fused in the absence of pressure in contact with other fibers in said layer to form a fiber structure of sufficient wet strength and integrity to be self-supporting in both dry and wet condition without any additional binder, the fibers in each of said two layers being bonded with one another and with fibers in the other layer by a water soluble adhesive binder to provide sufficient mechanical integrity throughout said two-ply facing material to allow normal handling of the dry material as a whole, and to help provide, together with the already existing mechanical interengagement of whole fibers in said outer layer, sufficient mechanical integrity in said outer layer to avoid disintegration of said outer layer when the bond between said two layers is weakened by dissolving out only a portion of said water soluble binder and is then ruptured by pulling said two layers apart, so that the dry, unsoiled two-ply facing material can be subjected to normal handling without damage to the material, and after use, the facing material and any solid waste matter deposited thereon can be immersed in water for a time, swirled around in the water to dissolve out only a portion of said water soluble binder, and pulled apart into two layers as above described, to produce a self-supporting, inner fibrous layer to be discarded separately from the outer layer, and a separate assemblage of substantially all said natural wood pulp fibers that were originally in said outer layer, which assemblage of fibers together with any residue of said solid waste matter not rinsed away by said swirling action can be flushed down a waste disposal system, where after the dissolving out of said water soluble binder is completed the assemblage will disintegrate into a multiplicity of separate individual fibers or small clumps of fibers.

11. The two-ply facing material of claim 1 which is superimposed on an absorbent fibrous batt to form an absorbent product.

12. The absorbent product of claim 11 which is superimposed on and attached to a liquid impermeable backing sheet to form a disposable infant's diaper.

15. In a diaper structure comprising a facing layer, an adsorbent batt and an impervious backing layer in which said facing layer and said backing sheet are outermost layers and said batt is positioned between said facing layer and said backing sheet, the improvement wherein said facing layer comprises the high loft, low density, nonwoven fibrous material of claim 1.

16. A method of producing a high loft, low density nonwoven, fibrous two-ply facing material for an absorbent product, such as a diaper, which comprises:

bringing together a first outer layer of irregularly arranged, intersecting, overlapping, mechanically interengaged, loosely assembled, natural wood pulp fibers defining interstices therebetween, and a second inner layer of similarly disposed fibers including intermixed natural wood pulp fibers and thermoplastic synthetic wood pulp fibers, said synthetic wood pulp fibers having a length and denier generally similar to natural wood pulp fibers, said second layer containing generally in the range of about 10 percent to about 30 percent by weight of thermoplastic synthetic wood pulp fibers, and said synthetic wood pulp fibers being present at the boundary surface of said second layer adjacent said first layer in a quantity sufficient to occupy no more than about 6 percent of the area occupied by the exposed fiber segments contained in said second layer at its said boundary surface, said synthetic wood pulp fibers having a melting point lower than the melting point of the other fibers in said two layers;

applying heat in the absence of pressure to said two fibrous layers thus brought together, to fuse at least some of said synthetic wood pulp fibers to each other and to some of said other fibers within said second layer to form a self-supporting fibrous structure in said second layer;

introducing a water soluble adhesive binder into said two fibrous layers and at the interface where said two layers have been brought together as described; and

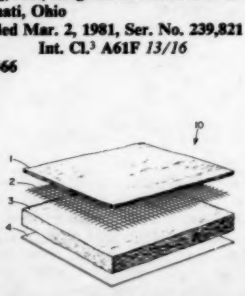
drying and curing said binder to produce a facing material with sufficient mechanical integrity to allow normal handling of said facing material, and in addition, help provide, together with the already existing mechanical engagement of whole fibers in said first layer, sufficient mechanical integrity in said first layer to prevent its disintegration when the bond between said two layers is ruptured to produce delamination of the two layers after only a portion of said water soluble adhesive binder has been dissolved out of the facing material and delaminating forces have been applied to the two layers.

4,392,862

ABSORPTIVE DEVICE

Mario S. Marsan, Cincinnati, Ohio, and Edward W. Hartwell, Lawrenceburg, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 2, 1981, Ser. No. 239,821
Int. Cl.³ A61F 13/16
U.S. Cl. 604—366 12 Claims



1. An absorptive device comprising a facing element, a fluid permeable support element, an absorbent pad, and an impervious backsheet wherein said facing element comprises a fluid permeable, unbonded web of hydrophobic thermoplastic fi-

bers, said fibers being from about 3 to about 15 denier; said web being formed without the use of bonding agents and having a density of from about 0.0002 to about 0.02 g/cc.; wherein said facing element is affixed to said support element in spaced apart regions of bonding by means selected from the group consisting of thermal bonding, hot melt adhesive bonding, and chemical adhesive bonding to form an assembly and said assembly is superimposed on said absorbent pad which is superimposed on said backsheet.

4,392,863

METHOD OF UNIFORMLY DYEING HIGH TEMPERATURE HEAT SET POLYESTER YARN

John C. Kaufmann, and Ronald S. Lenox, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Dec. 30, 1981, Ser. No. 335,759
Int. Cl.³ D06P 5/00; B29C 25/00
U.S. Cl. 8—400 4 Claims

1. A method of pre-treating a plurality of otherwise identical polyester yarns that have different heat histories, to enable said yarns to be dyed uniformly, which method comprises measuring the pre-melt crystallization temperatures of each polyester yarn and thereafter heat treating each yarn at temperatures that vary by no more than 5° C. and that are at least the same as or higher than the highest measured pre-melt crystallization temperature.

4,392,864

STABILIZED ROMANOWSKY STAIN SOLUTION

Elaine A. Helfrich, and Kin F. Yip, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 1, 1982, Ser. No. 344,390
Int. Cl.³ C09B 44/00; G01N 1/00
U.S. Cl. 8—506 4 Claims

1. A method for the preparation of a Romanowsky-type stain solution having improved stability characteristics which comprises dissolving in methanol a mixture of Methylene Blue, Azure A, Azure B, Azure C or a combination of these azure dyes and the free acid of Eosin Y in such amounts that the resulting solution exhibits spectrophotometric absorption of at least 230 optical density units at 645 nm and 128 optical density units at 525 nm.

4,392,865

HYDROCARBON-WATER FUELS, EMULSIONS, SLURRIES AND OTHER PARTICULATE MIXTURES

Aristid V. Grosse, Haverford, and Norman H. Cherry, Philadelphia, both of Pa., assignors to Lanko, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 771,272, Feb. 23, 1977, abandoned. This application Jan. 16, 1980, Ser. No. 112,507
Int. Cl.³ C10L 1/32; C01L 1/14
U.S. Cl. 44—51 26 Claims

1. In a mixture of water and a substance selected from the group consisting of oil and gasoline, the improvement comprising maintaining the stability of such mixture with reference to separation into continuous phases, through the addition thereto of a relatively low molecular weight hydrophilic-lipophilic agent and a high molecular weight swellable material, having a molecular weight of at least 500,000.

4,392,866

ETHERAMINE CORROSION INHIBITOR FOR ALCOHOLS

Rodney L. Sung, Fishkill; George J. Sidote, Hopewell Junction, and William M. Sweeney, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

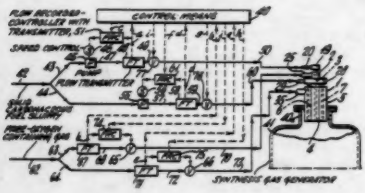
Filed Nov. 5, 1981, Ser. No. 318,532
Int. Cl.³ C10L 1/22
U.S. Cl. 44—53 22 Claims

1. A composition comprising
(i) a water-soluble alcohol; and
(ii) as corrosion inhibiting additive an effective corrosion-inhibiting amount of an amine having the formula

$$(ROR')_a\text{—}N\text{—}(R''NH_2)_b$$
$$\quad\quad\quad

reactant stream comprising a pumpable carbonaceous fuel slurry stream and a second reactant stream comprising a free-oxygen containing gas in the reaction zone of a gas generator comprising:

(1) introducing said first and second reactant streams into the reaction zone of a vertical free-flow noncatalytic refractory lined synthesis gas generator where said partial oxidation reaction takes place by way of a two-section burner mounted downward through an inlet port in the top of said gas generator and comprising central and annular sections with first and second fluid passage means in said central section and third and fourth fluid passage means in said annular section, a separate inlet means connected to each of said separate passage means, said burner having connected respectively to the two separate inlet means in the central section of said burner two separate feedlines **1** and **3** and having connected respectively to the two separate inlet means in the annular section of said burner two separate feedlines 2 and 4; wherein one feedstream of carbonaceous fuel slurry is passed through either the first or second fluid passage means in the central section of the burner and/or simultaneously another feedstream of carbonaceous fuel slurry is passed through the third or fourth fluid passage means in the annular section, and a separate feedstream of free-oxygen containing gas and if necessary a separate feedstream of steam are simultaneously passed through the unoccupied fluid passage means in each of the central and/or annular sections of said burner which are associated with the fluid passage means through which the stream(s) of carbonaceous fuel slurry are passing, said burner discharging into said reaction zone; and wherein



the central section of said burner includes a central conduit, said central conduit being closed at the upstream end and having a unobstructed downstream circular exit orifice at the tip of the burner; said annular section being bounded by an outer conduit coaxial and concentric with said central conduit along its length and in spaced relationship therewith and forming an annular passage therebetween, said annular passage being closed at the upstream end and having an unobstructed downstream annular exit orifice at the tip of the burner and wherein the central longitudinal axis of the annular passage is parallel to the central longitudinal axis of the burner throughout its length; said first passage means comprising a central bunch of tubes passing through the closed end of said central conduit and making a gastight seal therewith, and wherein the downstream ends of said central bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum diameter of the central conduit exit orifice at the tip of the burner; said second passage means comprising the space between the inside wall of said central conduit and the outside surfaces of the central bunch of tubes; said third passage means comprising an annular bunch of tubes passing through the closed end of said annular passage and making a gas tight seal therewith, and wherein the downstream ends of said annular bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum width of the annular exit orifice at the tip of the burner; and said fourth passage means comprising the space between the inside wall of the outer conduit and the outside surfaces of the annular bunch of tubes;

(2) separately sensing the flow rates for that portion of the first reactant stream flowing through feedlines **1** and **2** and that portion of the second reactant stream flowing through feedlines **3** and **4** and providing to a separate control means signals a, d and b, e corresponding respectively to the actual flow rates of the portions of said first and second reactant streams flowing in feedlines **1**, **2** and **3**, **4**; and

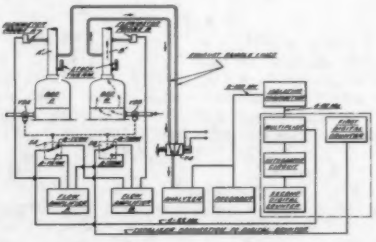
(3) comparing in said separate control means said actual flow rate signals a, d, b and e with manual or automatically computed input signals representing the desired flow rate or set point for each of the reactant streams in the four feedlines and providing corresponding adjustment signals c and f to separate speed controlled positive displacement pumps in feedlines **1** and **2** respectively, and signals h and j to flow control valves in feedlines **3** and **4** respectively, and thereby controlling the flow rates of said portions of first and second reactant streams flowing in said four feedlines in accordance with the respective desired flow rate or set point of each, to maintain in the reaction zone an atomic ratio of oxygen to carbon in the range of about 0.5–1.95.

4,392,870

VAPOR RECOVERY UNIT PERFORMANCE TEST ANALYZER AND METHOD

Anibole B. Chieffo; Howard K. Davis, both of Wilmington, Del., and Joyce A. Rizzo, West Chester, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 11, 1981, Ser. No. 262,144
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—20 **4 Claims**



1. A performance test analyzer for determining loss of hydrocarbons to the atmosphere when a tank truck or similar vehicle is filled with volatile hydrocarbons and wherein vapors of said hydrocarbons present during said filling operation are adsorbed in a first and second parallel charcoal bed operating alternately so that one bed is regenerated under vacuum while the other is adsorbing hydrocarbon vapors, comprising in combination:

(a) temperature sensing means in each of the stacks of said beds,

(b) a first flowmeter probe adapted to be inserted in the stack of said first charcoal bed,

(c) a second flowmeter probe adapted to be inserted in the stack of said second charcoal bed,

(d) a first flow amplifier and a second flow amplifier to enable the signal derived from said corresponding probe in a stack being tested to be fed into a first counter, the output of said counter reflecting the volume of gaseous flow in said stack under test as sensed by said respective first and second flowmeter probes,

(e) switching means in combination with first valving means effecting the cycling of said charcoal beds which switching means inactivate said first or second flow amplifier during the cycling of a corresponding first or second bed from regeneration to adsorption,

(f) exhaust sample lines from each of said stacks leading to

second valving means so as to enable gases from the stack being tested to be fed to hydrocarbon analyzing means for determining said hydrocarbons as propane concentration, whereby said hydrocarbon concentration, as propane, in each of said stacks at the time of test may be calculated from the parameters of (1) the barometric pressure at the test site, (2) the volume of gas from the stack being measured, (3) the measured stack temperature, and (4) the data from the analyzing means, and

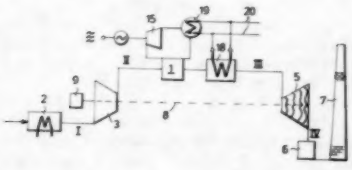
(g) electronic multiplier and integrator means to obtain the sum of said flow amplifier signal and said hydrocarbon analyzer means signal over the testing period, said sum being fed to a second counter to indicate the total flow integrated volume of hydrocarbon (as propane) in the exhaust of said stacks during the test period.

4,392,871

COMBUSTION PROCESS WITH WASTE GAS PURIFICATION

Göran Almlöf, Skattegarden 123, S-582 41 Linköping, and Peter Haggvist, Norrsvängen 1A, S-582 47 Linköping, both of Sweden

Continuation of Ser. No. 195,922, Oct. 10, 1980, abandoned. This application Aug. 18, 1982, Ser. No. 409,327
Claims priority, application Sweden, Oct. 16, 1979, 7908565
Int. Cl.³ B01D *47/05*
U.S. Cl. 55—23 **3 Claims**



1. A combustion process which provides an exhaust gas free of water vapor and other desirable contaminants, such as sulphur compounds, heavy metals and the like, including the steps of:

compressing air to be used for combustion,

burning fuel with the compressed combustion air in a combustion chamber,

directing the exhaust gases from the combustion chamber to an expansion means, and

expanding the heated exhaust gases in the expansion means to cause rapid cooling to a temperature of at least below zero degrees Celsius and drop in pressure of the exhaust gases to condense water vapor contained therein and to precipitate the undesirable contaminants.

4,392,872

AIR BLEEDER VALVE FOR WATERBED MATTRESSES

Charles P. Hall, Muir Beach, and John B. Johenning, Beverly Hills, both of Calif., assignors to Monterey Manufacturing, Inc., Los Angeles, Calif.

Filed Apr. 3, 1981, Ser. No. 250,864
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—36 **4 Claims**

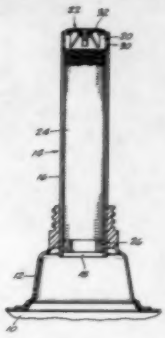
1. A method for bleeding air from the waterbed mattress having a fill spout comprising the steps of:

(a) selecting an air bleeder valve comprising:

(i) an elongated, hollow tubular body having first and second ends and corresponding first and second end portions wherein at least the first end portion is adapted to snugly fit into the fill spout of a waterbed mattress;

(ii) a porous water barrier in the tubular body for preventing water from splashing out of the mattress when bleeding air from the mattress, the water barrier being constituted of a non-water absorbing material, the barrier not acting as a wick for water and being sufficiently porous that when wet, air can pass through the barrier; and

(iii) a check valve at the second end of the tubular body for allowing air to pass out of the body through the second end and for preventing air from passing into the body through the second end;



(b) placing the bleeder valve into the fill spout so that at least the first end portion of the tubular body is snugly fit into the fill spout; and

(c) subsequently causing air in the mattress to pass to the fill spout and out the bleeder valve, wherein water is prevented from splashing out of the mattress by the water barrier and air is prevented from passing from the atmosphere into the mattress by the valve.

4,392,873

CONTINUOUS VAPOR PHASE CHROMATOGRAPHY

Francis R. Brockington, 4016 MacGregor Dr., Columbia, S.C. 29206

Filed Jun. 12, 1981, Ser. No. 272,964
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **6 Claims**

1. A chromatographic process in which both the gas phase and the liquid/solid phase are mobile and traversing in opposing directions through a common column which has one or more thermal gradients impressed lengthwise across it, and in which a mixture to be chromotograph is continuously introduced, partitioned and collected as fractions from the gas phase where:

A. The said thermal gradients are formed by simultaneously heating a section of the column and cooling another section through the use of heat exchangers;

B. The said liquid/solid phase moves in direction in the column toward increasing column temperatures;

C. The said gas phase moves in a direction opposite the liquid/solid phase and toward increasing column temperatures;

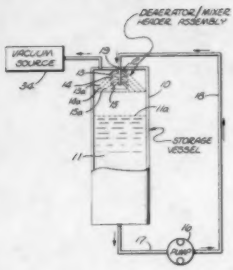
D. The said mixture to be chromatographed is introduced to the column at the lower temperature end of the column and at a metered rate;

The said fractions of the mixture are collected through the use of ducts which are dispersed along and intersect with the column, and said ducts are fitted with condensers and gas flow control devices.

4,392,874
DEGASSIFYING AND MIXING APPARATUS FOR LIQUIDS

Samuel T. Yamauchi, Fountain Valley, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1981, Ser. No. 325,082
Int. Cl.³ B01D 19/00
U.S. Cl. 55—194 **6 Claims**

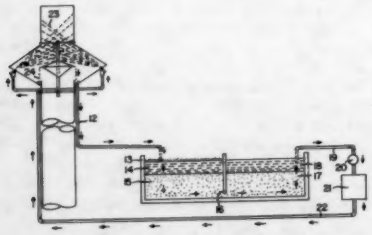


1. Liquid degassifying apparatus comprising: a vacuum tight vessel for containment of liquid to be subjected to continuous degassing operations, the level of said liquid within said vessel producing a first liquid volume therein, the remainder of the volume of said vessel comprising a second volume; a header assembly within said second volume, said header assembly including a stacked, spaced plurality of axially narrow orifices, each of said orifices extending generally circumferentially about the axis of said header assembly to produce a plurality of cascades of spaced generally concentric, conical, liquid films into said first volume and means for adjusting the thickness of the liquid films; a first means including a liquid input and manifold for said header assembly, said manifold being formed of a generally cylindrical body having a generally axial cavity therein, and a liquid passage connecting each of said orifices to said liquid manifold; a second means for circulating said liquid from said first volume to said header assembly liquid input; and a third means for partially evacuating said second volume.

4,392,875
SMOG ELIMINATOR

Roberto V. Celis, Goodrich Village, Marikina, Philippines

Filed Feb. 11, 1981, Ser. No. 347,949
Int. Cl.³ B01D 47/00
U.S. Cl. 55—228 **2 Claims**



1. A device for eliminating carbon particulates from smoke using continuous, recirculating, pressure water sprays in a uniquely designed spray booth which is mounted on a smoke stack and means for cleaning the recirculating pressure water, which comprises:

(a) a spray booth means comprising two conical sections joined at the bases thereof, the upper section being connected in a leak-proof way to the upper section of a smoke stack and the lower section being connected in a leak-proof way to the lower section of a smoke stack;

(b) a conical deflector means, centrally mounted by a mounting means within said spray booth means, having an upwardly directed vertex and a base diameter greater than the diameter of the lower section of said smoke stack;

(c) a spray means comprising a multiplicity of spray nozzels mounted around the inner circumference of the lower conical section of the spray booth means, adjacent to the juncture of the bases of the upper conical section and the lower conical section, and directed to spray above said conical deflector means within the upper conical section, whereby sprayed recirculating pressure water encounters rising smoke first as sprayed upward and second as deflected downward on striking the inside wall of the upper conical section of said spray booth;

(d) a water collecting means comprising the lower section of the smoke stack being connected to the lower conical section in a leak-proof way such that the upper-most edge of said smoke stack section protrudes into the spray booth means to form an annular water collecting gutter;

(e) a gravity drain means comprising a pipe mounted at the lowest edge of the lower conical section such that water in the water collecting means will drain through said pipe by gravity;

(f) an open water tank partially filled with sand and divided into two compartments by a partial vertical wall, said vertical wall being mounted so as to prevent flow from one compartment to the other except at the base thereof along the bottom of the open water tank;

(g) a recirculation pump; and

(h) a pressurized recirculation water reservoir; whereby, smoke containing carbon particulates in the smoke stack rising into the spray booth means has particulates removed therefrom by entrainment in pressured water sprayed into the upper part of said spray booth means, the washed smoke thereafter rising into the upper section of the smoke stack while the pressurized water containing carbon particulates drops onto the conical deflector means and is deflected into the water collecting means, from which said water drains through the gravity drain means into the first compartment of the open water tank, passing through the sand filling and under the vertical wall into the second compartment of the open water tank by gravity, the majority of the carbon particulates being removed in the sand filling, being drawn into the recirculation pump, pumped into the pressurized recirculation water reservoir, and returned to the spray booth means through the spray means.

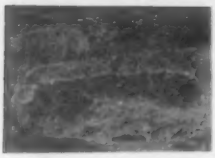
4,392,876
FILTER PACKING

Klaus Schmidt, Kaiserslautern, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 15, 1981, Ser. No. 302,574
Claims priority, application European Pat. Off., Sep. 15, 1980, 80105531
Int. Cl.³ B01D 39/14
U.S. Cl. 55—524 **5 Claims**

1. A filter packing comprising a composite of electrostatically spray formed microfibers alone or in combination with one or more porous carrier layers, wherein the microfibers comprise a nonporous fiber core surrounded by a foamed coating layer containing open cell pores which extend through

the foam coating in a substantially perpendicular direction to the surface, the cross section distribution of pores being substantially uniform and the foamed coating and the fiber core being made of the same polymer composition.

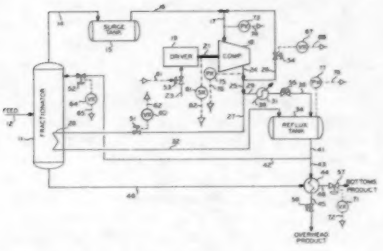


4,392,877

CONSTRAINT CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Gary L. Funk, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 6, 1981, Ser. No. 309,333
Int. Cl.³ B01D *3/42*
U.S. Cl. 62—37 **7 Claims**



1. Apparatus comprising:

a fractional distillation column having a reboiler associated therewith;

means for providing a feed stream containing components to be separated to said fractional column;

a compressor having a suction inlet and a discharge outlet;

means for providing an overhead stream from said fractional distillation column to the suction inlet of said compressor;

first control valve;

means for providing fluid from the discharge outlet of said compressor through said first control valve to said reboiler to thereby supply heat to said fractional distillation column;

means for establishing a first signal representative of the actual position of said first control valve;

means for establishing a second signal representative of the desired position of said first control valve;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the speed of said compressor required to maintain said first signal substantially equal to said second signal;

means for establishing a fourth signal representative of the actual suction pressure for said compressor;

means for establishing a fifth signal representative of the maximum allowable suction pressure for said compressor;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal, wherein said sixth signal is scaled so as to be representative of the speed of said compressor required to maintain the magnitude of said fourth signal substantially equal to the magnitude of fifth signal;

means for establishing a seventh signal representative of the actual discharge pressure for said compressor;

means for establishing an eighth signal representative of the minimum allowable discharge pressure for said compressor;

means for comparing said seventh signal and said eighth signal and for establishing a ninth signal which is responsive to the difference between said seventh signal and said eighth signal, wherein said ninth signal is scaled so as to be representative of the speed of said compressor required to maintain the magnitude of said seventh signal substantially equal to the magnitude of said eighth signal;

high select means;

means enabling provision of said third signal, said sixth signal and said ninth signal as inputs to high select means, wherein the one of said third, sixth and ninth signals representing the highest speed of said compressor is selected by high select means and is provided as a tenth signal from said high select means; and

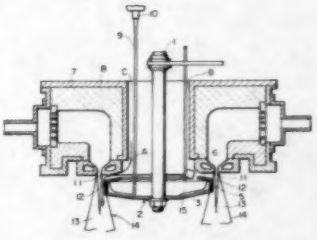
means for controlling the speed of said compressor in response to said tenth signal.

4,392,878

GLASS FIBER FORMING UNIT

Kiwamu Okuma; Tsunehiro Haga; Masao Kizara; Keiji Otuki, and Ayahiro Hirai, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Dec. 14, 1981, Ser. No. 330,261
Claims priority, application Japan, Dec. 19, 1980, 55/180207
Int. Cl.³ C03B *37/04*
U.S. Cl. 65—6 **4 Claims**



3. In a method of forming glass fiber in a unit including a hollow-cylinder-shaped rotating spinner having (a) a bottom, (b) a surrounding wall having upper and lower outer surfaces and with a number of molten glass projecting orifices where the molten glass projects from each orifice such that a transition cone of the glass is formed with its base at the orifice and primary filaments of the glass extending from the apex of the cone, and (c) an upper annular flange extending inwardly from the upper edge of said surrounding wall; and an attenuating blast burner with jet flame orifices for attenuating primary filaments formed at the tips of transition cones of molten glass projecting from said rotating spinner into secondary filaments where the jet flame comprises an inner cone of flame surrounded by an outer cone of flame, the speed of the inner flame being greater than that of the outer flame, the improvement comprising

directing each jet flame from each jet flame orifice, so that (1) the inner cone of flame (a) contacts said primary filaments to attenuate them into the glass fibers due to the high speed of this flame and (b) does not contact said transition cones sufficiently to break them even though

the speed thereof is sufficient to do so and (2) the outer cone of flame is in substantial contact with only the lower outer surface of said surrounding wall of said hollow-cylinder-shaped rotating spinner where the speed of said outer cone of flame is such as to not break said transition cones, and

jetting a flame in a direction which is along the prolongation of said upper annular flange and which is in parallel with the surface of said upper annular flange, said flame from said heating burner heating said rotating spinner in such a manner that said flame goes along at least the upper surface of said upper annular flange to transmit heat to at least a corner where said upper annular flange of said hollow-cylinder-shaped rotating spinner and said surrounding wall meet such that the heat supplied to the upper surface of the surrounding wall by the heating burner and the heat supplied to the lower surface thereof by said outer cone of flame results in a substantially uniform temperature of the surrounding wall to thereby enhance fiber glass uniformity.

4,392,879

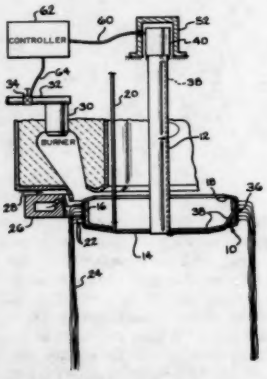
METHOD OF FORMING GLASS FIBERS WHILE MONITORING A PROCESS CONDITION IN A SPINNER

Kunthiko Takeuchi, Newark, and James S. Belt, Utica, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 304,775, Sep. 23, 1981, abandoned. This application Sep. 1, 1982, Ser. No. 413,920

Int. Cl.³ C03B *37/04*

U.S. Cl. 65—6 **17 Claims**



1. The method for the manufacture of mineral fibers comprising supplying molten mineral material to the interior of a spinner having an orificed sidewall, and rotating said spinner to cause said molten mineral material to pass through the sidewall orifices to form mineral fibers, wherein the improvement comprises monitoring a process condition with a sensing means, said sensing means being mounted for rotation with said spinner, and transmitting a signal from a wireless transmitter mounted for rotation with said spinner to a receiver spaced apart from said transmitter, said signal being responsive to the sensed process condition.

4,392,880

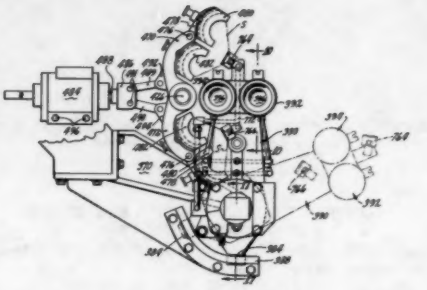
GLASSWARE FORMING APPARATUS WITH BLOW MOLD SPRAY MEANS

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 179,381, Aug. 18, 1980, Pat. No. 4,339,264. This application May 7, 1982, Ser. No. 375,847

Int. Cl.³ C03B *9/38, 40/02*

U.S. Cl. 65—170 **4 Claims**



1. In a glassware forming apparatus having a neck ring arm, at least one neck ring assembly mounted on said arm, a blank mold arm having at least one blank mold mounted thereon, means for moving said blank mold arm between a first position wherein said blank mold is in a position mating with said neck ring assembly for the formation of a parison, and a second position wherein said blank mold is down and swung away from the axis of the neck ring assembly, at least one split blow mold mounted beneath said neck ring arm, said split blow mold having blow mold segments pivotable toward and away from each other, the improvement comprising nozzle means mounted on said blank mold arm for directing a spray of lubricant to said blow mold segments when they are positioned away from each other, and means providing a supply of lubricant to said nozzle means when said blank mold arm is in said first positions, the opening of said blank mold being above the spray of lubricant.

4,392,881

PROCESS FOR COMPOSTING DECAYING MATERIAL OF ORGANIC WASTE AND/OR SEWAGE SLUDGE IN TWO PROCESSING STEPS

Franz Kneer, Eschenburg-Eibelshausen, Fed. Rep. of Germany, assignor to Gebrüder Weiss KG, Dillenburg, Fed. Rep. of Germany

Filed Jun. 30, 1981, Ser. No. 279,065

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024813

Int. Cl.³ C02F *11/16*

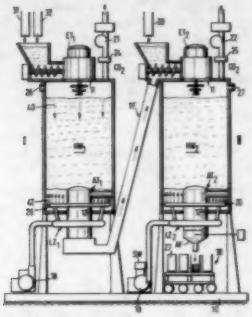
U.S. Cl. 71—9 **5 Claims**

1. A process for compositing decaying material selected from the group consisting of organic waste or sewage sludge in two processing steps comprising:

(a) treating the decaying material to achieve a decayable C/N ratio and then continuously and countercurrently aerating the decaying material in the first processing step so as to decay the material both anaerobically and aerobically, wherein the decaying material is brought into a first vessel from above and discharged from the bottom in such a manner, that each particle of the column of material consisting of decaying material passes through the first vessel within 7 to 14 days and the column of material is aerated countercurrently and continuously from below in such a manner that different heat layers and oxygen layers are formed within the column of material and thereby support a specific distribution of aerobic or anaerobic

bacteria throughout said column which effect decaying and render it biologically active; and

(b) directly introducing this continuously aerated material to the second processing step by transferring the biologically active material from the first vessel to a second vessel



which is closed to the atmosphere at a rate such that it passes through the second vessel within 14 to 20 days and is aerated discontinuously during this time at intervals in such a manner that only aerobic processes take place in the column of material present to mature the decaying material in said second vessel.

4,392,882

N-N-BIS(HALOACYL)-DIAZA-CYCLOALKANES FOR PROTECTING PLANTS FROM HERBICIDE DAMAGE

Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Wilfried Faust, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

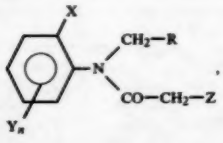
Filed Jul. 7, 1980, Ser. No. 166,412

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930452

Int. Cl.³ A01D *25/32*

U.S. Cl. 71—92 **15 Claims**

1. Method for protecting maize from damage by herbicidally active acetanilides of the formula



(VI)

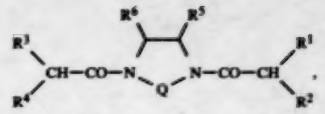
wherein

R represents pyrazol-1-yl -or pyrazol-1-yl substituted by halogen or alkyl with 1 to 4 carbon atoms,

X and Y are identical or different and represent alkyl with 1 to 4 carbon atoms,

Z represents chlorine and

n represents 0,1 or 2, and herbicidally active acid addition salts and metal salt complexes thereof, which comprises applying to the plants or their habitat an antidotally effective amount of N,N'-bis-(haloacyl)-diazacycloalkane compound of the formula



(I)

wherein

R^1 is methyl or chlorine;

R^2 is chlorine;

R^3 is methyl or chlorine;

R^4 is chlorine;

R^5 is hydrogen or alkyl with 1 or 2 carbon atoms;

R^6 is hydrogen or alkyl with 1 or 2 carbon atoms; and

Q is an alkylene chain which has 2 or 3 carbon atoms and can be mono-substituted by methyl.

4,392,883

HERBICIDAL COMPOSITION AND PROCESS

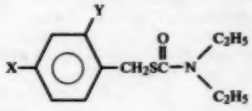
Shinichi Iori; Ikuo Kajiwara, both of Shizuoka, and Kazuo Jikihara, Niiza, all of Japan, assignors to Kumiai Chemical Industry Co. Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,093

Int. Cl.³ A01N *43/64, 37/00*

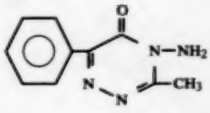
U.S. Cl. 71—93 **4 Claims**

1. A herbicidal composition for inhibiting growth of smartweed, goosefoot and barnyardgrass consisting essentially of an effective amount of a mixture of a thiocarbamate derivative of the general formula:



I

wherein one of X and Y represents a hydrogen atom and the other is a chlorine atom, and 4-amino-3-methyl-6-phenyl-1,2,4-triazin-5(4H)-one of the formula:



II

in a ratio of 1:1 to 4:1 by weight as active ingredients.

4,392,884

HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

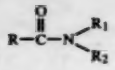
Division of Ser. No. 930,967, Aug. 4, 1978, Pat. No. 4,269,618, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application May 7, 1980, Ser. No. 147,434

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.³ A01N *37/02, 37/18*

U.S. Cl. 71—100 **140 Claims**

1. A herbicidal composition comprising a non-phytotoxic, antidotally effect amount of an active herbicidal thiolcarbamate compound and an antidote therefor corresponding to the formula:



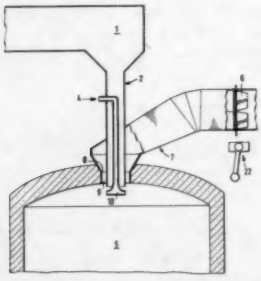
wherein R is haloalkyl having 1 to 6 carbon atoms inclusive; R_1 and R_2 can be the same or different and can be selected from the group consisting of hydrogen, alkyl having 1 to 12 carbon atoms inclusive, haloalkyl having 1 to 12 carbon atoms inclusive, alkenyl having 2 to 12 carbon atoms inclusive, haloalkenyl having 2 to 12 carbon atoms inclusive, alkynyl having 2 to 12 carbon atoms inclusive, hydroxyalkyl having 2 to 12 carbon atoms inclusive, hydroxyhaloalkyl having 2 to 12 carbon atoms inclusive, cycloalkyl having 3 to 6 carbon atoms inclusive, alkylcycloalkyl having 4 to 8 carbon atoms inclusive, alkoxyalkyl having 2 to 20 carbon atoms inclusive and cycloalkenyl having 3 to 6 carbon atoms inclusive; provided that when R_1 is hydrogen R_2 is other than hydrogen; said antidote compound being antidotally active with said thiolcarbamate herbicide compound wherein said compound is present in an amount varying between about 0.001 to 30 parts by weight for each part by weight of the active thiolcarbamate herbicide compound.

4,392,885

METHOD AND APPARATUS FOR FORMING A DIRECTIONED SUSPENSION SPRAY OF A PULVEROUS MATERIAL AND A REACTION GAS

Launo L. Lilja, and Valto J. Mäkitalo, both of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Dec. 10, 1981, Ser. No. 329,301
Claims priority, application Finland, Dec. 30, 1980, 804053
Int. Cl.³ C22B *1/10*
U.S. Cl. 75—26 **9 Claims**



1. A method of forming a directioned and controlled suspension spray of a pulverous material and a reaction gas by causing the pulverous material to flow into a reaction chamber and by directing a flow of the reaction gas evenly around the flow of pulverous material, comprising dividing the uninterrupted reaction-gas flow into at least three partial flows and then deflecting the direction of the partial flows 30°–90° so as to be substantially parallel to the central axis of the reaction chamber, the velocity of the partial flows being simultaneously increased, causing the partial reaction-gas flows thus formed, with minimal pressure losses, to discharge as an annular flow encircling the flow of pulverous material fed from inside the flow, which is caused to discharge in the reaction chamber and to mix effectively with this reaction-gas flow, which is not rotated as a whole, in order to produce a turbulent but controlled suspension spray necessary for the reactions.

4,392,886

METHOD OF RECOVERING CO-RICH EXHAUST GAS IN REFINING OF METAL

Mikio Kodaka; Hitoshi Morishita; Hajime Bada, and Fumio Sudo, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP81/00039, § 371 Date Oct. 22, 1981, § 102(e) Date Oct. 22, 1981, PCT Pub. No. WO81/02429, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 27, 1981, Ser. No. 313,951
Claims priority, application Japan, Feb. 29, 1980, 55-23964
Int. Cl.³ C21C *5/34, 5/36*
U.S. Cl. 75—52 **7 Claims**

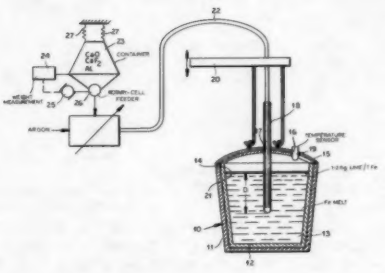
1. A method of recovering CO-rich exhaust gas in refining of metal, comprising blowing granular limestone together with a carrier gas into a molten iron having a carbon concentration of at least 0.3% and kept in a metal-refining vessel through a tuyere located beneath the bath surface to generate CO, and recovering the CO-containing exhaust gas in an exhaust gas-recovering apparatus.

4,392,887

METHOD OF DESULFURIZING AN IRON MELT

Jean Goedert, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Dec. 4, 1981, Ser. No. 327,450
Int. Cl.³ C21C *7/02*
U.S. Cl. 75—58 **6 Claims**



1. A method of desulfurizing an iron melt comprising the steps of:

(a) forming a bath in a ladle having an upper surface free from slag;

(b) covering said surface with 1 to 2 kg. of lime per ton of melt;

(c) covering said ladle;

(d) independently of the covering of said surface with lime, deoxidizing said melt to a maximum oxygen concentration of about 35 parts per million; and

(e) independently of the covering of said surface with lime, blowing a desulfurizing mixture with an inert gas through an immersion lance into said melt at an average depth of about 1500 mm below said surface, said mixture consisting substantially of 50 to 98% lime, at least 1% Al up to 30% aluminum and at least 1% CaF_2 up to 20% calcium fluoride.

4,392,888

METAL TREATMENT SYSTEM

Charles E. Eckert, Plum Boro, and Ronald E. Miller, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 7, 1982, Ser. No. 337,529
Int. Cl.³ C22B *21/06*
U.S. Cl. 75—68 R **38 Claims**

1. In a process for treating molten metal wherein said metal

is contacted with halogen values from a gas containing a halocarbon the improvement comprising contacting said halocarbon with an oxidizer under conditions to oxidize carbon constituent thereof prior to introducing said halogen values into the molten metal.

4,392,889

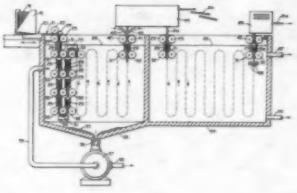
METHOD AND APPARATUS FOR RECOVERING SILVER AND PLASTIC FROM USED FILM

Kenneth M. Grout, Littleton, N.H., assignor to Kenmartin Development, Inc., Littleton, N.H.

Filed Jun. 22, 1981, Ser. No. 275,981

Int. Cl.³ C22B *11/00*; B29H *19/00*; C08J *1/00*

U.S. Cl. 75—97 A **10 Claims**



1. The method of recovering silver and polyester from photographic film of the type comprising a polyester base having a surface coating which provides adhesion for a silver emulsion layer on said surface coating, said method comprising:

(a) passing the film through a bath of a material which will attack the silver emulsion layer until it separates from the film and deposits as a sludge in said bath;

(b) removing said sludge from said bath;

(c) separating the solid silver containing particles of said sludge from the liquid portion of said sludge,

(d) passing the film, cleansed of said silver emulsion, through a second bath of a material which will attack and remove said surface coating from said polyester base;

(e) restraining said film from having any portion of its surface coming into contact with any other film surface throughout its travel through said baths, whereby any agglomeration of film is avoided; and

(f) removing said cleansed polyester from said second bath;

(g) whereby said silver containing particles and said cleansed polyester constitute the desired valuable recovery products.

5. An apparatus for recovering silver and polyester from a photographic film of the type having a polyester base having a surface coating which provides adhesion for a silver emulsion layer on said surface coating, comprising:

(a) a bath of a material which will attack and remove the silver emulsion layer from said film,

(b) means for feeding said film into said bath;

(c) means for guiding said film through said bath along a path of sufficient length so that the time of travel through said bath is sufficient to cause said bath to substantially completely remove said emulsion from said film and deposit it as a sludge in said tank;

(d) means for removing said sludge from said tank and for separating the solid silver containing particles of said sludge from its liquid portion, whereby said separated solid particles may be used as a valuable recovery product;

(e) a second bath of a material which will attack and remove said surface coating from said polyester base;

(f) means for feeding said film, cleansed of said silver emulsion, into said second bath;

(g) means for guiding said film through said second bath along a path of sufficient length to cause said bath to substantially completely remove said surface coating from said polyester base;

(h) means for leading said polyester base, cleansed of said surface coating, out of said second bath as a second valuable recovery product;

(i) each of said guiding means being constructed and adapted to restrain said film from coming into contact with any other film surface, whereby agglomeration of said film is prevented.

4,392,890

CEMENT CLINKER PRODUCTION

Jean-Pierre Henin, La Madelaine, and Gerard Ghestem, Santes, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Mar. 3, 1982, Ser. No. 354,347

Claims priority, application France, Mar. 6, 1981, 81 04475

Int. Cl.³ C04B *7/02*

U.S. Cl. 106—100 **12 Claims**

1. A method of producing cement clinker from cold, dry, finely divided raw material, which comprises the steps of

(a) causing hot flue gases to flow in a first direction out of a rotary kiln having an axis,

(b) suspending a major portion of the finely divided raw material in the hot flue gases until the raw material has been preheated and at least partially decarbonized,

(c) introducing the preheated and at least partially decarbonized raw material into the kiln, and

(d) pneumatically injecting a fraction of the cold, dry, finely divided raw material into an end of the kiln and countercurrently to said first direction approximately parallel to the axis of the kiln to form a dust cloud of the raw material occupying substantially the entire cross section of the kiln at said end, the end being upstream with respect to a second direction of flow of the raw material into the kiln.

4,392,891

DISHWASHER SOIL COLLECTING CIRCUIT

Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 165,467, Jul. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 974,342, Dec. 29, 1978, abandoned. This application Nov. 9, 1981, Ser. No. 319,831

Int. Cl.³ B08B *3/02*, *7/04*

U.S. Cl. 134—10 **23 Claims**

21. A method of washing soiled food ware supported on racks in a chamber of a dishwasher, comprising the steps of:

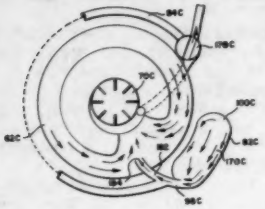
filling a sump at the bottom of said chamber with a wash solution, thereby initiating a soil collecting cycle;

spraying said food ware and flushing soil therefrom to said sump by pumping said solution under pressure from said sump through spray arms with a recirculating pump, thereby forming a soil laden solution in said sump;

ingesting said soil laden solution from said sump during said soil collecting cycle and passing said soil laden solution through a soil collecting circuit independent of said recirculating pump;

filtering soil particles from said soil laden solution in said

circuit to collect and retain said filtered particles within said circuit thereby preventing reentrance of said filtered particles into said chamber during said soil collecting cycle and returning supernatant from said circuit for recirculation by said spray arms; and



upon completion of said soil collecting cycle, emptying said circuit of collected soil particles into said sump for draining the solution and said soil particles therefrom.

4,392,892

PROCESS FOR SEPARATING HYDROCARBONS FROM PARTICULATE SOLIDS

Fritz Wagner, Stöckheim; Walter Lindörfer, Kassel; Wilhelm Jahn-Held, Staufenberg, and Walther Schulz, Vechta, all of Fed. Rep. of Germany, assignors to Wintershall Aktiengesellschaft, Kusel and Gesellschaft fur Biotechnologische Forschung, Braunschweig-Stockheim, both of, Fed. Rep. of Germany

Continuation of Ser. No. 82,631, Oct. 5, 1979, abandoned. This application Sep. 18, 1981, Ser. No. 307,092

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843685

Int. Cl.³ B08B *3/08*

U.S. Cl. 134—25.1 **11 Claims**

1. A process for separating oils or petroleum hydrocarbons from solid or solid/liquid mixtures thereof with particles of soil, sand or petroleum processing residues, which comprises the steps of (a) mixing said oil-containing mixture with an aqueous solution or dispersion of a crude extract of microbially produced glycolipids to form a slurry, said extract being obtained by a method consisting essentially of the steps of extracting a microbial culture solution with a solvent for glycolipids and evaporating the solvent from the extract; and (b) adding water, an aqueous salt solution or sea water to the slurry in an amount sufficient to cause a rapid rising of an oil phase from an aqueous phase; and (c) separating the oil phase from the aqueous phase, whereby said particles are rendered substantially oil-free.

4,392,893

METHOD FOR CONTROLLING CHARACTERISTICS OF A SEMICONDUCTOR INTEGRATED CIRCUIT BY X-RAY BOMBARDMENT

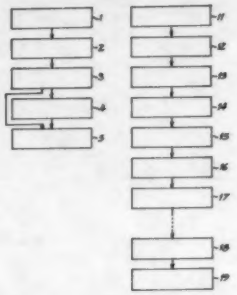
Nguyen T. Du, Hatogaya, and Akihide Asao, Ohita, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 17, 1980, Ser. No. 207,178

Int. Cl.³ H01L *21/265;* B01J *17/00*

U.S. Cl. 148—1.5 **6 Claims**

1. A method for manufacturing a semiconductor integrated circuit to provide a specific value of an electrical characteristic, comprising the steps of preparing a silicon substrate for said integrated circuit having a substrate resistivity of no more than 10Ω. cm at least at a portion of said substrate, forming a semiconductor device at an area including said portion of said substrate, testing said electrical characteristic of said integrated circuit, and thereafter irradiating a predetermined amount of X-ray to a surface of said semiconductor device of said integrated circuit to alter said electrical characteric measured in said test.



4,392,894

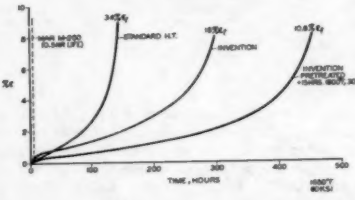
SUPERALLOY PROPERTIES THROUGH STRESS MODIFIED GAMMA PRIME MORPHOLOGY

David D. Pearson, West Hartford; Frank D. Lemkey, Glastonbury, and Bernard H. Kear, Madison, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 177,047, Aug. 11, 1980, Pat. No. 4,328,045, which is a continuation-in-part of Ser. No. 973,193, Dec. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 913,131, Jun. 6, 1978, abandoned. This application Sep. 24, 1980, Ser. No. 190,137

Int. Cl.³ C22F *1/10*

U.S. Cl. 148—2 **13 Claims**



1. A method for producing a high strength nickel superalloy article of the type having a gamma-gamma prime microstructure including the steps of:

(a) providing a homogeneous single crystal article of a gamma-gamma prime type alloy in which both the gamma and gamma prime phases are saturated in refractory elements, in which the gamma prime phase has a lattice parameter which is at least 0.1% smaller than the lattice parameter of the gamma phase, and in which (at equilibrium) the gamma prime phase is present in from 30–75 volume percent;

(b) heating the article to a temperature between the gamma prime solvus and the incipient melting temperature so as to dissolve the gamma prime phase into solid solution;

(c) cooling the article at a rate sufficient to effectively suppress growth of the gamma prime phase;

(d) applying a stress along an axis to the article while simultaneously heating it to a temperature at which growth of the gamma prime phase will occur;

whereby the gamma prime phase grows in an oriented manner and the resultant microstructure is exceptionally resistant to creep along the axis of stress application during aging.

7. A nickel base gamma-gamma prime superalloy article

adapted to resist stresses at elevated temperatures along a principal axis which comprises:

a microstructure comprised of a gamma phase matrix containing aligned rods of the gamma prime phase oriented substantially parallel to the principle axis, with the spacing between adjacent gamma prime lamellae being less than about 0.5 micron;

said gamma and gamma prime phases being substantially saturated with refractory elements, said gamma prime phase having a lattice parameter which is at least 0.1% smaller than the gamma phase lattice parameter, and said gamma prime phase being present in an amount of from 30 to about 75 volume percent.

4,392,895

RAMJET FUEL

Russell Reed, Jr.; George W. Burdette; Gary W. Meyers, and William R. Vuono, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 9, 1981, Ser. No. 319,159
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.3 **11 Claims**

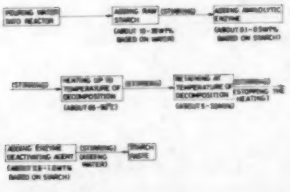
1. A solid ramjet fuel composition comprising a functionally terminated fluorocarbon prepolymer, a functionally terminated polybutadiene prepolymer, a curative cross-linking compound for both prepolymers, and metallic fuel.

4,392,896

METHOD OF PRODUCING A GYPSUM PLASTER BOARD

Syoji Sakakibara, Nagoya, Japan, assignor to Sakakibara Sangyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 18, 1982, Ser. No. 340,183
Int. Cl.³ B32B *31/06, 13/08*
U.S. Cl. 156—39 **12 Claims**



1. Method of producing a gypsum plaster board comprising the steps of:

(a) preparing a starch paste wherein starch is added into water with stirring to form milk of starch, into which an amylolytic enzyme is added, and heated with stirring until the decomposition temperature of said starch is reached, and then the heating operation is stopped at a point of DH 0.1–10 and an enzyme deactivating agent is added and stirred with water;

(b) mixing said starch paste with a raw material of a gypsum core member containing calcined gypsum, reinforcing agent and weight reducing agent as well as water to prepare a gypsum slurry;

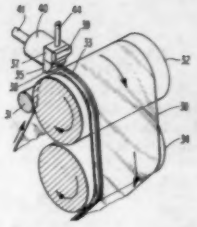
(c) producing a gypsum plaster board wherein said gypsum slurry is poured between porous sheets such as paper boards and molded to a predetermined thickness by a molding device, then said gypsum slurry is set by hydration at room temperature and dried at about 50°–200° C. so as to evaporate excessive moisture therein.

4,392,897

MANUFACTURING PROCESS FOR CHANNEL SEAL

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,814
Int. Cl.³ B29C *24/00;* B65D *33/24*
U.S. Cl. 156—66 **32 Claims**



25. A method of attaching a channel shaped adhesive strip having ribs along each side and an adhesive layer between said ribs to a plastic film comprising:

moving a web of said film past a coextruding assembly;

extruding a channel shaped strip of thermoplastic onto said moving web;

applying a layer of adhesive between the ribs of said strip; and

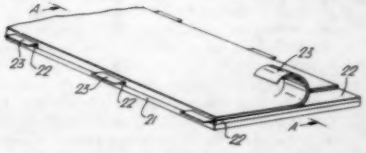
maintaining a temperature differential between said molten thermoplastic and said moving web so that said extruded thermoplastic channel strip adheres to said moving web upon contact and thereafter cools to set said extruded thermoplastic channel strip in said channel profile with said adhesive between the ribs of said strip.

4,392,898

DEVICE FOR ENCLOSING OBJECTS

Kenneth B. Pithouse, Swindon, England, and Christopher J. Swinmurn, Cupertino, Calif., assignors to Raychem Limited, London, England

Continuation of Ser. No. 259,286, Apr. 30, 1981, abandoned. This application Mar. 31, 1982, Ser. No. 364,086
Claims priority, application United Kingdom, May 3, 1980, 8014923; Sep. 13, 1980, 8029663
Int. Cl.³ B29C *27/00;* B32B *31/00;* A61F *13/02;* H02G *13/06*
U.S. Cl. 156—85 **22 Claims**



1. A device for enclosing at least part of an object, which comprises:

a dimensionally heat-recoverable cover;

adhesive means coated on at least part of the cover for retaining the cover in position during heat recovery of the cover;

sealant means covering the adhesive means for preventing the adhesive means from adhering to the article and at least a portion of the sealant means being separable from the adhesive means; and

whereby upon separation of the sealant means, the adhesive means may adhere to the object with the cover enclosing at least part of the object.

18. A method of enclosing at least part of an object by means of a device as set forth in claim 1, which comprises the steps of:

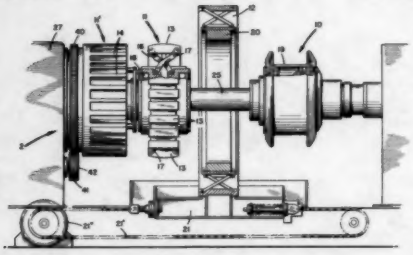
(a) positioning the cover about the object so that one portion of the cover can overlie another part thereof;
(b) peeling a portion of the sealant means from the said portion of the adhesive means to allow the adhesive means to adhere to a surface of the object;
(c) causing the said portion to overlie the other part of the cover so that the portion is bonded thereby by the adhesive means; and
(d) heating the cover to cause recovery thereof.

4,392,899

PROCESS AND APPARATUS FOR MANUFACTURING VEHICLE TIRES

Giorgio Bertoldo, Arese, Italy, assignor to Societa Pneumatici Pirelli S.p.A., Milan, Italy

Filed Oct. 15, 1981, Ser. No. 311,601
Claims priority, application Italy, Oct. 15, 1980, 25340 A/80
Int. Cl.³ B29H *17/20*
U.S. Cl. 156—127 **10 Claims**



1. In a process for manufacturing tires which comprise a carcass, an annular reinforcing structure, and a tread-band which process comprises the steps of:
(a) preparing a carcass of a first tire in a cylindrical form on a first expandable drum;
(a) building an annular reinforcing structure for the first tire on a hollow drum having a comb-shaped surface;
(c) expanding the sectors of a second expandable drum, between void spaces of the comb, from an inner position to an outer position of the comb, thereby shaping and supporting the annular reinforcing structure only with the sectors;
(d) slipping the comb-shaped drum from the drum-with-sectors;
(e) applying a tread-band on the annular structure while it is supported by the sectors of the second drum;
(f) transferring the annular reinforcing structure and the tread-band from the second to the first expandable drum;
(g) expanding the first expandable drum to impart a final toroidal shape to the tire; and
(h) removing said tire from said first expandable drum;
the improvement which comprises the additional steps of
(i) building the annular reinforcing structure of a second tire on the comb-shaped drum in a slipped position from the sectors after step (d);
preparing a carcass of a second tire in a cylindrical form on said first expandable drum after completion of step (h);
(j) transferring, after step (f), the annular reinforcing structure of the second tire while supported by the comb-shaped drum around the sectors of the second drum; and
(k) repeating steps (c) to (h).

3. In an apparatus for making a vehicle tire having a carcass, a tread band, and an annular reinforcing structure disposed between the carcass and the tread band, said apparatus comprising a building drum, axially separable into two distinct parts and recomposable into an assembled unity, for manufacturing and shaping said annular reinforcing structure and for assembling it with said tread band, said two distinct parts being respectively constituted by a first cylindrical, hollow, comb-shaped drum (11'), for manufacturing said annular structure, and by a second expandable drum (11) with sectors (13), for shaping the annular structure and for supporting said shaped annular structure during its assembling with the tread band, said comb-shaped drum having its teeth (14) off-set with the sectors of the expandable drum when said building drum is in the state of assembled unity, the sectors of said second drum being radially expandable through the void spaces in between the teeth of the comb-shaped drum from inside towards the outside of said comb, said apparatus also comprising means to axially slide said comb-shaped drum from and towards said expandable drum, bringing said two drums alternatively axially separated, in a position of no mutual interference, and joined together in assembled unity,
the improvement wherein means are provided for allowing and for causing the comb-shaped drum to rotate independently in direction and speed with respect to the expandable drum, and centering means for aligning the teeth of said comb-shaped drum in off-set relationship with the sectors of the expandable drum, all said means acting when said drums are axially separated from each other.

4,392,900

METHOD AND APPARATUS FOR APPLYING A PATCH

Clarence H. Helbing, 485 Tailholt La., Shelbyville, Ind. 46176

Filed Jan. 21, 1982, Ser. No. 341,489
Int. Cl.³ B32B *31/12*
U.S. Cl. 156—153 **10 Claims**

1. A method for applying a patch having an elastomeric mounting surface on a battery case or the like, the battery case comprising a polypropylene surface area, the method comprising the steps of:
a. abrading the polypropylene surface area of the battery case sufficiently to remove a surface layer and expose the underlying surface of the battery case;
b. applying hydrogen peroxide to the exposed, underlying surface of the battery case;
c. after step b., applying a layer of cyanoacrylate adhesive to the exposed, underlying surface of the battery case; and
d. positioning the patch with the elastomeric mounting surface against the adhesive.

4,392,901

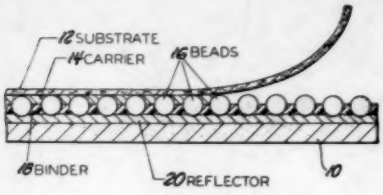
REFLECTIVE GARMENT AND METHOD OF MANUFACTURING SAME

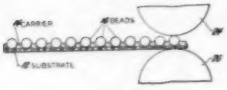
Vincent S. Pernicano, 2833 Railroad St., Boyne Falls, Mich. 49713, and Michael R. Wright, 24297 Ridgeview Dr., Farmington Hills, Mich. 48018

Division of Ser. No. 198,926, Oct. 20, 1980, abandoned, which is a division of Ser. No. 60,466, Jul. 25, 1979, Pat. No. 4,248,500. This application Feb. 19, 1982, Ser. No. 350,333
Int. Cl.³ B32B *31/00*; **C09J** *7/00*
U.S. Cl. 156—155 **1 Claim**

1. A method of making a reflective heat transfer combination including the steps of; applying a tacky mixture of tack wax and mineral spirits in a carrier layer over a paper substrate capable of absorbing the carrier layer when melted in response to heat, disposing a layer of glass beads over the carrier layer, forcing the glass beads into the carrier layer and against the substrate while allowing portions of the beads to be exposed above the carrier layer, applying a liquid binder layer around the beads and over the carrier layer, drying the binder layer, applying a liquid reflective coat over the binder layer and covering the beads, applying powdered adhesive over the reflective coat while the reflective coat is liquid, and drying the reflective coat and applying the heat transfer combination

to an article by placing the coating with the powdered adhesive therein against the article and applying heat and pressure





to activate the powdered adhesive whereby the adhesive responds to heat and melts and bonds to the article.

4,392,902

METHOD FOR PRODUCING A SIEVE BELT OF THERMOSETTABLE SYNTHETIC RESIN HELICES FOR A PAPERMAKING MACHINE

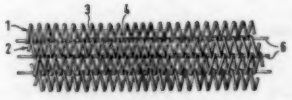
Johannes Lefferts, Enschede, Netherlands, assignor to Steg Siebtechnik GmbH, Ahaus-Alstatte, Fed. Rep. of Germany

Division of Ser. No. 111,497, Jan. 11, 1980, Pat. No. 4,346,138. This application Mar. 25, 1982, Ser. No. 362,039

Claims priority, application Netherlands, Apr. 23, 1979, 7903176; Fed. Rep. of Germany, Sep. 21, 1979, 2938221

Int. Cl.³ B32B *5/00*; D04H *3/02*

U.S. Cl. 156—161 **5 Claims**



1. A method for producing a sieve belt characterized by the following method steps:

(a) meshing helices of thermosettable synthetic resin filament by inserting the windings of one helix between the windings of an adjacent helix so that the overlapping windings form a channel, the meshed helices being free of bias,

(b) passing a pintle-filament into said channel,

(c) extending the thus-formed sieve belt by applying longitudinal tension, and

(d) thermosetting the sieve belt in said extended condition.

4,392,903

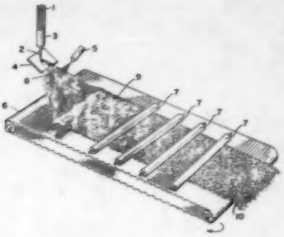
PROCESS FOR MAKING A THERMAL-INSULATING NONWOVEN BULKY PRODUCT

Tadakazu Endo, Ohtsu; Hirotsugu Suzuki, Tokyo, and Masanori Takahashi, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 146,078, May 2, 1980, Pat. No. 4,320,166. This application Sep. 25, 1981, Ser. No. 305,377

Int. Cl.³ B32B *3/28*

U.S. Cl. 156—167 **5 Claims**



1. A process for producing a thermal insulating nonwoven bulky product the steps which comprise

(a) spinning the filaments of a synthetic polymer under fluid pressure,

(b) releasing the spun filaments together with fluid at high velocity for crimping and separating,

(c) crimping and separating the filaments,

(d) spraying the crimped and separated filaments with a binder,

(e) spreading out and accumulating the separated filaments into layers, and

(f) heating the layered filaments to the final product.

4,392,904

SCULPTURED LAMP BASE

Gregory A. Van Pelt, 634 Wenonah Ave., Oak Park, Ill. 60304

Filed Jan. 14, 1981, Ser. No. 225,009

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—194 **3 Claims**

1. In a method for the production of sculptured lamp bases, the steps comprising: winding a pre-slit strip of single wall corrugated cardboard around a central core threaded or otherwise designed for the attachment of lamp hardware to form a tightly wound spiral of a certain diameter; positioning said spiral on a mold comprising a plurality of ribs radiating around a vertical axis coincident with said central core; distending said spiral downwardly along said mold beginning with the centermost position of said spiral; tautly shaping the distended spiral to conform with the shape of the mold; applying glue to the molded spiral to the inner surfaces thereof and about the central core and the outermost edge of the spiral; repeating the prior steps to form a mating molded spiral; gluing the bottom

of the first molded spiral to the top of the mating spiral; and coating the completed lamp base with glue.

4,392,905

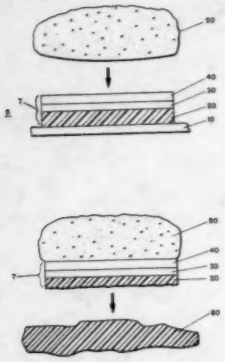
METHOD OF TRANSFERRING DESIGNS ONTO ARTICLES

Mary G. Boyd, Framingham, and Donald R. Smith, Dover, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Jul. 30, 1981, Ser. No. 288,589

Int. Cl.³ B32B *31/00*; B65C *9/25*; C09J *5/06*

U.S. Cl. 156—235 **38 Claims**



1. A process for transferring a film laminate to an article from a support member, wherein the film laminate comprises a resinous coating layer in contact with said support member, an ink layer, and a protective coating layer, said resinous coating layer comprised of a film forming component which is the polymerization product of a diamine with a dimerized fatty acid, said process comprising the steps of:

(a) heating the support member to a first temperature above the melting point of the resinous coating layer,

(b) heating the surface of a resilient transfer pad to a second temperature lower than said first temperature,

(c) pressing the heated transfer pad against the film laminate to transfer the laminate thereto,

(d) pressing the film laminate against the article so that the resinous coating layer contacts the article, and

(e) withdrawing the transfer pad from the article so that the pad separates from the film laminate, which remains in adhesive contact with the article.

4,392,906

METHOD OF AND APPARATUS FOR MANUFACTURING FASTENER ASSEMBLIES

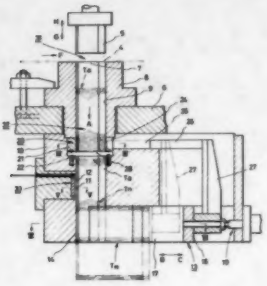
Saburo Hara, Tokyo, Japan, assignor to Toska Co., Ltd.; Japan Bano'k Co., Ltd., both of Tokyo, Japan and Ben Clements & Sons, Inc., Hackensack, N.J.

Filed Sep. 9, 1981, Ser. No. 300,523

Int. Cl.³ B32B *31/18*, *31/26*

U.S. Cl. 156—250 **8 Claims**

1. A method of manufacturing a continuous assembly of fasteners, each said fastener including a head section and a bar section joined together by a filament section comprising the steps of successively punching individual fasteners out of a sheet of synthetic resin material, successively delivering said fasteners in a downward direction so that said fasteners are laminated in a continuous stack of fasteners, heating the bar sections of said fasteners so that said bar sections are fused together to form a continuous assembly of joined fasteners, successively stretching the filament sections of said fasteners,



and delivering said stacked, joined and stretched fasteners in a continuous assembly.

4,392,907

METHOD FOR PRODUCING RECORDING HEAD

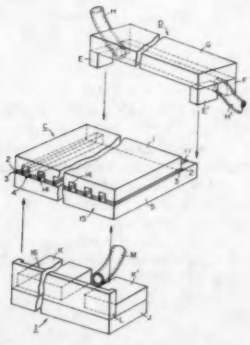
Yoshiaki Shirato, Yokohama; Yasushi Takatori, Sagamihara; Toshitami Hara, Tokyo; Yukuo Nishimura, Sagamihara, and Michiko Takahashi, Higashi Ohizumi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 133,317, Mar. 24, 1980, abandoned. This application Oct. 7, 1981, Ser. No. 309,411

Claims priority, application Japan, Mar. 27, 1979, 54-36040; Mar. 27, 1979, 54-36042; Mar. 29, 1979, 54-37385; Mar. 29, 1979, 54-37389

Int. Cl.³ B32B *31/18*; G01D *15/16*

U.S. Cl. 156—252 **17 Claims**



1. A method for producing a recording head for ejecting a recording liquid in an action chamber from an orifice connected with said action chamber in a state of small droplets and depositing at least a part of said droplets onto a recording surface to achieve recording, said method comprising a step X′ for forming a member a′ having a perforation for constituting said action chamber by forming a curable resin layer on a surface of a first sub-member, forming a groove on said surface bearing said resin layer and curing said resin layer while said surface bearing said resin layer is maintained in contact with a second sub-member thereby adjoining said sub-members, a step Y′ of adjoining an end aperture of said perforation to another member b′ constituting an intermediate supply chamber of said liquid, and a step Z′ of attaching to member a′ another member c′ for forming an opening in the vicinity of the other end aperture of said perforation.

4,392,908

PROCESS FOR MAKING ABSORBENT ARTICLES

Roger B. Dehnel, Sharnbrook, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,864
Claims priority, application United Kingdom, Jan. 25, 1980, 8002624
Int. Cl.³ B32B 31/00; C09J 5/00; B22F 3/00
U.S. Cl. 427—194 5 Claims

1. A process for manufacturing a water-absorbent article in which particles of a water-swellable polymer are fixed to a water-absorbent substrate, which process comprises:

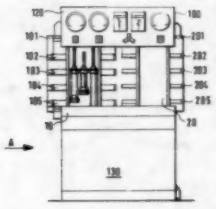
1. forming on the surface of the water-swellable particles a coating of a thermoplastic adhesive resin to form coated particles;
2. locating the coated particles in their unswollen and dry state on or within the water-absorbent substrate also in the dry state; and
3. applying heat to soften the thermoplastic coating of the particles and pressing the particles and substrate to cause the particles to be bound to the substrate.

4,392,909

METHOD AND DEVICE FOR PRODUCING MULTILAYER PRINTED CIRCUIT BOARDS

Hans Bohn, Schopfloch; Wolfgang Stein, Freudenstadt; Peter Bernsau, Wittlensweiler, and Fred Staubitzer, Dornstetten, all of Fed. Rep. of Germany, assignors to Robert Bürkle GmbH & Co., Freudenstadt, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,722
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032931
Int. Cl.³ C09J 5/10
U.S. Cl. 156—306.9 6 Claims



1. A method of assembling a plurality of printed circuit boards into a permanently bonded multilayer circuit board stock, the method comprising the steps of

stacking printed circuit boards in alternation with bonding layers of thermosetting resin-based plastic to form multilayer stacks;

heating a first multilayer stack under compression in a first panel press to a curing temperature at which the material of the bonding layers undergoes a curing process;

precooling the first multilayer stack under compression in the first panel press to a transfer temperature which lies between the curing temperature and the ambient temperature;

transferring the precooled first multilayer stack from the first panel press to a second panel press;

loading a second multilayer stack in the first panel press; and

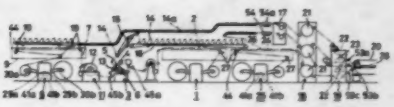
aftercooling the transferred multilayer stack under compression in the second panel press to a temperature in the vicinity of the ambient temperature, while heating the second multilayer stack in the first panel press as aforesaid.

4,392,910

WEB ALIGNING PROCESS AND APPARATUS

Masuteru Tokuno, Nishinomiya; Yoshinori Ishii, Yao, and Hidetoshi Hoshiyama, Ibaragi, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Sep. 21, 1981, Ser. No. 304,340
Claims priority, application Japan, Oct. 2, 1980, 55-138517
Int. Cl.³ B65H 25/26
U.S. Cl. 156—361 5 Claims



1. An apparatus for aligning at least two running webs to be glued together with each other in the production of corrugated fiberboard, said apparatus comprising:

two web position detectors provided adjacent to a gluing station for detecting the lateral positions of the respective webs,

a computing means for combining the signals from said web position detectors to generate a difference signal proportional to the difference therebetween,

web moving means disposed at a position at a predetermined distance upstream of the detection point for correcting any lateral displacement of one web in relation to the other,

a moved distance detector means for generating a signal proportional to the distance for which the web has been moved by said web moving means,

READY signal generator means for generating a first READY signal from when the web corrected has run at least for said predetermined distance after the last correction of displacement and generating a second READY signal at least from when a spliced point has passed the detection point after splicing of one web to the other web, and

a timing controller which in the presence of said first READY signal gives a timing signal until the signal from said moved distance detector means becomes equal to said difference signal,

said web moving means operating while it receives said timing signal and said second READY signal.

4,392,911

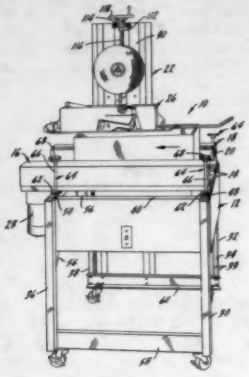
APPARATUS FOR SEALING CARTONS

Lawrence W. Ulrich, and Connie W. Walker, both of Bolingbrook, Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Filed May 12, 1982, Ser. No. 377,336
Int. Cl.³ B31F 1/00
U.S. Cl. 156—468 38 Claims

1. Apparatus of the type used for sealing the foldable flaps of cartons; said apparatus including a frame structure, a sealing head assembly mounted to said frame structure, and at least one longitudinally extending side arm assembly mounted to said frame structure; said frame structure comprising: a pair of entrance leg members positioned in a common transverse vertical plane and a pair of exit leg members positioned in a common transverse vertical plane spaced from the plane of said entrance leg members, said entrance leg members and said exit leg members including a front leg member and a rear leg member; an entrance cross support member extending between the upper portions of said entrance leg members and an exit cross support member extending between the upper portions of said exit leg members, said entrance cross support member and said exit cross support member being formed with upwardly extending open channel portions; and means secured to said side arm assembly for slidable receipt within said channel

portions of said entrance cross support member and said exit cross support member so as to permit selective transverse



movement of said side arm assembly above said channel portions.

4,392,912

BOBBIN CHANGER FOR JOINING SUCCESSIVE REELS OF WEB OF THE CIGARETTE INDUSTRY

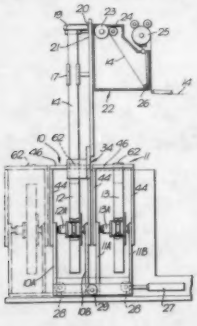
John K. Horsley, High Wycombe, England, assignor to Molins Limited, London, England

Filed Apr. 15, 1981, Ser. No. 254,284

Claims priority, application United Kingdom, Apr. 15, 1980, 8012336

Int. Cl.³ B65H *19/14, 19/18, 19/20*

U.S. Cl. 156—504 **13 Claims**



12. A bobbin changer comprising a splicing device for joining the leading end of the web on each new reel to the web on the expiring reel; at least two cradles for receiving and supporting reels of the web during use, each having means for locating the end of the web of a new reel in readiness for splicing, the locating means including an upwardly-extending arm which carries a cross-bar including means for releasably holding the end of the web on each new reel in the position needed for splicing, and means for movably supporting each of the cradles whereby each cradle in turn can be moved from a standby position to an operative position aligned with the splicing device in preparation for a splicing operation; the splicing device including a fixed member having suction ports for gripping the expiring web, once it has stopped, in preparation for splicing, and an opposed movable member, said movable member and an opposed portion of said fixed member being set at a level below the cross-bar of each cradle, the leading end portion of a new reel being moved into a position between the fixed and movable members when the cradle carrying that reel is moved to the operative position splicing being effected by movement of the movable member towards the fixed member, the splicing device further including a knife arranged to cut the expiring web below the suction ports to remove the tail end, the arrangement being such that, after the tail end of expiring web has been cut by the knife, the means moving the cradles is arranged to operate to bring the new web to a position between the old web and the movable member, whereby movement of the movable member towards the fixed member will press the two webs together and effect a joint by means of adhesive carried by the new web, for example, in the form of double-sided adhesive tape.

4,392,913

LABELLING APPARATUS

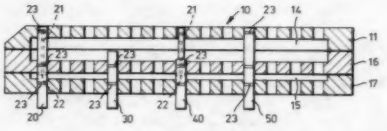
Peter J. Baumli, 213 Carrington Rd., Coogee, New South Wales, Australia

Filed Jun. 15, 1981, Ser. No. 273,311

Claims priority, application Australia, Jun. 23, 1980, PE4157/80

Int. Cl.³ B32B *35/00*

U.S. Cl. 156—584 **11 Claims**



1. A programmable platen for a label applying system comprising a top plate, a bottom plate and a dividing plate therebetween defining two gas chambers, a predetermined arrangement of through bores extending in alignment through said three plates and a plurality of removable valving pins adapted to fit said through bores; each of said chambers being adapted to be coupled to a source of positive or negative gas pressure and wherein the surface of the platen at each valving pin location is subject to positive and/or negative pressure depending upon the form of valving pin fitted in each through bore in accordance with a predetermined program for arranging said valving pins; each valving pin extending between at least two of said plates and having gas sealing means between said pin and at least two of said plates.

4,392,914

METHOD FOR MANUFACTURING MASK FOR COLOR CRT

Shigeo Takenaka; Eiji Kamohara, and Kazuyuki Seino, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 1, 1982, Ser. No. 413,896

Claims priority, application Japan, Sep. 10, 1981, 56-141739

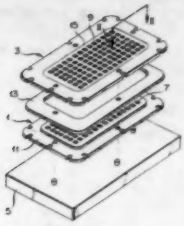
Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—633 **9 Claims**

1. A method for manufacturing a mask for a color CRT in which a plurality of flat mask members each of which has a number of apertures in an effective area thereof are formed, and the plurality of mask members are fixed at predetermined distances with the apertures thereof being aligned with each other, comprising the steps of:

bringing into tight contact and fixing in position at least parts of said effective areas which have said apertures of said flat mask members with an insulator interposed between peripheral portions surrounding said effective areas of said plurality of flat mask members;

press forming said plurality of flat mask members to provide a predetermined radius of curvature thereto; and



fixing said effective areas in position at said predetermined distances after shifting apart said plurality of mask members.

4,392,915

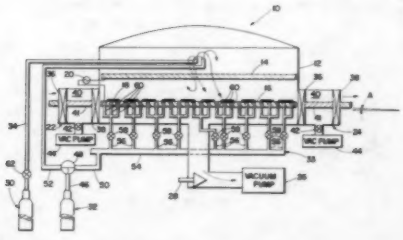
WAFER SUPPORT SYSTEM

John Zajac, San Jose, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 16, 1982, Ser. No. 348,625

Int. Cl.³ H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 **13 Claims**



9. A method of operating a plasma etcher comprising positioning one or more wafers on an electrode within the vacuum chamber of said plasma etcher, directing a flow of a first gas into said vacuum chamber above said one or more wafers at a first predetermined volume flow, and selectively directing a second gas into said vacuum chamber through said electrode toward the one or more wafers positioned thereon at a second predetermined volume flow to alternately support said one or more wafers on a cushion of said second gas and then allow said one or more wafers to come to rest in engagement with said electrode.

4,392,916

PAPER-MAKING PROCESS WITH REGENERATED CHITIN FIBERS

Masashi Nishiyama, Kanonji; Yoshinari Kobayashi, Kagawa; Seiichi Tokura, and Norio Nishi, both of Sapporo, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo and President of Hokkaido University, Hokkaido, both of, Japan

Continuation-in-part of Ser. No. 235,588, Feb. 18, 1981, abandoned. This application Feb. 23, 1982, Ser. No. 351,636

Claims priority, application Japan, Jun. 17, 1980, 55-82258

Int. Cl.³ D21H *5/12*

U.S. Cl. 162—157.1 **4 Claims**

1. A method for the preparation of a paper composed of chitinous fibers without the use of a binder material which comprises the steps of

(a) preparing a dope by dissolving chitin, an alkylated chitin or an acetylated chitin in a solvent,

(b) spinning the dope through a spinning nozzle into a coagulating bath to form fibers,

(c) chopping the fibers into staples,

(d) dispersing the staples of the fibers in water to make a fiber suspension, and

(e) subjecting the fiber suspension to sheet making, in which the fibers formed in the step (b) are subsequently kept wet with water throughout down to the step (e).

2. A method for the preparation of a paper from once dried fibers of a regenerated chitinous material of chitin, an alkylated chitin or an acetylated chitin by subjecting a fiber suspension of the chitinous fiber to sheet making without the use of a binder material which comprises contacting the once dried chitinous fibers with a hydrogen-bond forming agent and rinsing the thus treated chitinous fibers with water subsequently keeping the fibers wet with water down to the step of the sheet making.

4,392,917

AMPHOTERIC WATER-IN-OIL SELF-INVERTING POLYMER EMULSION

Stanley A. Lipowski, Livingston, and John J. Miskel, Jr., Mendham, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 84,986, Oct. 15, 1979, Pat. No. 4,330,450. This application Oct. 5, 1981, Ser. No. 308,175

Int. Cl.³ D21H *3/38*

U.S. Cl. 162—168.1 **10 Claims**

1. In pulp and papermaking processes, the improvement which comprises adding to pulp an effective amount of an amphoteric water-in-oil self-inverting polymer emulsion having

(a) from about 10 to about 50 parts by weight of a polymer selected from the group consisting of

(1) a copolymer having from about 30 to about 99 parts by weight of a water soluble nonionic vinyl monomer and from about 1 to about 70 parts by weight of a water soluble amphoteric vinyl monomer, and

(2) a terpolymer having from about 30 to 98 parts by weight of a water soluble nonionic vinyl monomer, from about 1 to about 35 parts by weight of a water soluble anionic vinyl monomer and from about 1 to about 35 parts by weight of a water soluble cationic vinyl monomer,

(b) from about 10 to about 50 parts by weight of water,

(c) from about 5 to about 50 parts by weight of a hydrophobic liquid,

(d) from about 2 to about 25 parts by weight of a water-in-oil emulsifying agent, and

(e) from about 1 to about 15 parts by weight of an inverting surfactant

wherein the polymer is in the aqueous phase to improve drainage of the pulp.

4,392,918

TOROIDAL FIELD COIL TORQUE STRUCTURE

Albert L. Gaines, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

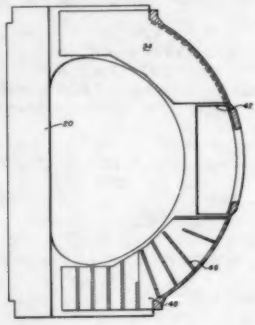
Filed Jul. 25, 1979, Ser. No. 60,555

Int. Cl.³ G21B *1/00*

U.S. Cl. 376—133 **10 Claims**

1. In a fusion reactor of the Tokamak-type that employs a toroidal magnetic field for purposes of effecting the confinement of the plasma therewithin, the fusion reactor including a multiplicity of toroidal field coils operable to produce said toroidal magnetic field, the improvement comprising a torque structure for providing support for the multiplicity of toroidal field coils, said torque structure forming a frame structure operable to enable torque loads acting on the toroidal field coils to be equilibrated as close to the area of force application as possible, said torque structure comprising:

a. a membrane shell positioned in surrounding relation to the toroidal field coils and operative to substantially enclose the toroidal field coils therewithin, said membrane shell including a multiplicity of membrane sections interconnected one to another so as to collectively effect the enclosure of the toroidal field coils, each of said multiplicity of membrane sections including a first segment, a second segment and a third segment, said first segment being operative to define a plane, said second segment having one end thereof affixed to one end of said first segment, said second segment having the other end thereof spaced outwardly away from said first segment and inclined at an angle in a first direction from the plane of said first segment, said third segment having one end thereof affixed to the other end of said first segment, said third segment having the other end thereof spaced outwardly away from said first segment and inclined at an angle in a second direction from the plane of said first



segment, said first segment having an opening formed therein to provide access to the interior of the fusion reactor; and

b. an intercoil structure including a multiplicity of intercoil sections, each of said multiplicity of intercoil sections interposed between an adjoining pair of toroidal field coils, each of said multiplicity of intercoil sections being cooperatively associated with a corresponding one of said multiplicity of membrane sections, each of said multiplicity of intercoil sections including a first spacer wedge and a second spacer wedge, said first spacer wedge and said second spacer wedge each being affixed to the corresponding one of said multiplicity of membrane sections such that said first spacer wedge and said second spacer wedge are located in spaced relation one to another and on opposite sides of the opening formed in said first segment of the corresponding one of said multiplicity of membrane sections.

4,392,919

CHARGING APPARATUS FOR COKE COOLING CHAMBERS

Manfred Galow, and Horst Joseph, both of Essen, Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,381

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011575

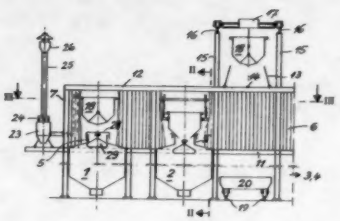
Int. Cl.³ C10B *39/02, 39/12*

U.S. Cl. 202—228 **10 Claims**

1. In combination an apparatus for the dry cooling of coke including a dry coke cooling chamber and a charging opening in said chamber wherein hot coke is transferred by means of a coke bucket to said cooling chamber, charging apparatus for charging said coke cooling chamber with said hot coke comprising:

an enclosure including a roof, a bottom and sides, said enclosure encompassing at least an upper portion of said cooling chamber such that the charging opening of the cooling chamber extends into the enclosure, said enclosure being essentially gastight when sealed,

means for selectively opening and sealably closing an opening in said enclosure permitting access of said coke bucket to the interior of the enclosure, and sealing of said enclosure when said bucket is in the interior thereof for charging said coke to said cooling chamber,



transport means for shuttling said coke bucket into and out of said enclosure and to said coke cooling chamber for charging said coke to said cooling chamber,

exhaust gas treatment means for evacuating said enclosure of emissions generated by the charging of the cooling chamber and for controlling release of said emissions to the atmosphere, and

gas feed means connected to said enclosure for supplying inert gas to the interior of the enclosure.

4,392,920

METHOD OF FORMING OXIDE COATINGS

Glen E. McDonald, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 10, 1981, Ser. No. 272,152

Int. Cl.³ C25D *5/50*; C25B *1/02*

U.S. Cl. 204—37 R **7 Claims**

1. In a method of covering a substrate with a black metal oxide film from an electroplating bath containing about 270 grams per liter of cobalt sulfate, about 37 grams per liter of cobalt chloride, and about 30 grams per liter of boric acid having a pH in the range between about 1.5 and about 4.5 at a temperature between about 45° C. and about 60° C. to form a coating that is highly absorbing, the improvement comprising the steps of

adding an oxidizing agent to said bath,

placing a metal substrate in said electroplating bath to form a cathode,

electrodepositing a compound of cobalt from said bath onto said substrate at said cathode by passing a current of about 400 amps per square meter of substrate therethrough in the presence of said oxidizing agent thereby forming an oxide coating containing hydrated cobalt oxides, and

contacting said coated substrate with water having a temperature substantially at the boiling point.

4,392,921

COMPOSITION AND PROCESS FOR ELECTROPLATING WHITE PALLADIUM

Kathleen B. Miscioscio, Bayside, N.Y., and Paul T. Smith, Pascoag, R.I., assignors to Occidental Chemical Corporation, Warren, Mich.

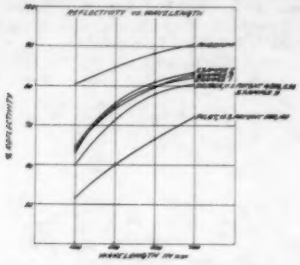
Filed Dec. 17, 1980, Ser. No. 217,318

Int. Cl.³ C25D *3/50*

U.S. Cl. 204—47 **2 Claims**

1. A stable aqueous electroplating bath suitable for obtaining thin, white deposits of palladium metal which consists essen-

tially of a bath soluble source of pure palladium metal, free of alloying elements, which source is present in amounts sufficient to provide from about 0.1 to about 20 g/l palladium in the bath, from about 30 to about 120 g/l of a bath soluble ammo-



nium conductivity salt, a sufficient amount of ammonium hydroxide to adjust and maintain the pH in the bath of from about 8 to 10 and a buffer selected from ammonium biborate and sodium tetraborate to maintain the pH within said range.

4,392,922

TRIVALENT CHROMIUM ELECTROLYTE AND PROCESS EMPLOYING VANADIUM REDUCING AGENT

Thaddeus W. Tomaszewski, Dearborn, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed Nov. 10, 1980, Ser. No. 205,406

Int. Cl.³ C25D *3/06*

U.S. Cl. 204—51 **35 Claims**

1. An aqueous acidic trivalent chromium electrolyte containing trivalent chromium ions, a complexing agent for maintaining the trivalent chromium ions in solution, halide ions, ammonium ions, hydrogen ions to provide a pH on the acid side, and a reducing agent comprising vanadiums ions present in at least an amount effective to maintain the concentration of hexavalent chromium ions at a level which is not in excess of 0.4 grams/liter.

4,392,923

PROCESS FOR PREPARING THIAZOLINOZETIDINONE DERIVATIVES

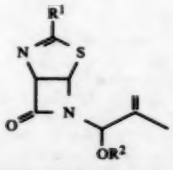
Sigeru Torii, Akaiwa; Hideo Tanaka, Okayama; Junzo Nokami, Okayama; Michio Sasaoka, Okayama; Norio Saito, Itano, and Takashi Shiroi, Okayama, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Aug. 9, 1982, Ser. No. 406,505

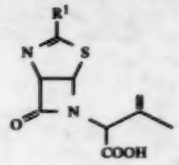
Int. Cl.³ C25C *1/00*; C07D *99/10*

U.S. Cl. 204—59 R **11 Claims**

1. A process for preparing a thiazolinoazetidinone derivative represented by the formula



wherein R^1 represents aralkyl group or aryloxymethyl group and R^2 represents acyl group, the process comprising electrolyzing a compound of the formula



wherein R^1 is as defined above in the presence of a lower fatty acid.

4,392,924

PROCESS FOR CONTROLLING THE PERMEABILITY OF DIAPHRAGMS IN THE PREPARATION OF POLYVALENT METALS BY ELECTROLYSIS AND AN ELECTROLYSIS CELL FOR CARRYING OUT THE PROCESS

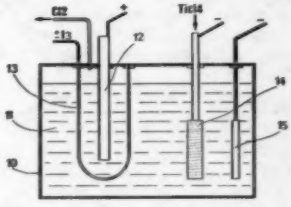
Marcel Armand, Meylan, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

Filed Oct. 20, 1981, Ser. No. 313,229

Claims priority, application France, Nov. 27, 1980, 80 25504

Int. Cl.³ C25C *3/26, 3/28, 3/34, 7/06*

U.S. Cl. 204—64 T **4 Claims**



1. A process for controlling the permeability of the diaphragm of an electrolysis cell for the preparation of a metal selected from the group consisting of Ti, Zr, Hf, V, Nb and Ta, from an electrolyte based on molten metal halides, the diaphragm being coated with a deposit of the metal to be produced, characterised in that said control is provided by a deposit growth or re-dissolution process which is controlled in dependence on the voltage drop in the electrolyte impregnating the diaphragm, or a measured variable linked to said voltage drop.

4,392,925

ELECTRODE ARRANGEMENT IN A CELL FOR MANUFACTURE OF ALUMINUM FROM MOLTEN SALTS

Hanspeter Alder, Flurlingen, and Eugen Schalch, Neuhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 27, 1981, Ser. No. 257,891

Claims priority, application Switzerland, May 14, 1980, 3873/80

Int. Cl.³ C25C *3/08*

U.S. Cl. 204—67 **28 Claims**

1. An electrolytic cell for use in the production of aluminum comprising:

a pot having a floor and sidewalls;

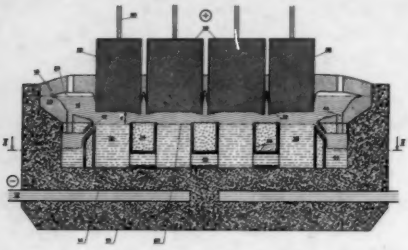
a melt of liquid aluminum within said pot on said floor;

a molten electrolyte within said pot on said melt of liquid aluminum;

at least one anode within said pot projecting into said molten electrolyte such that the top surface of said melt of liquid

aluminum is a distance d from the active bottom surface of said at least one anode; and

insulating means within said pot in said melt of liquid aluminum for reducing the surface area of said melt of liquid



aluminum in direct contact with said molten electrolyte such that the total surface area of said melt of liquid aluminum exposed to said molten electrolyte is from about 10–90% the active surface area of said at least one anode.

4,392,926

PROCESS AND APPARATUS FOR PRODUCTION OF ALUMINUM

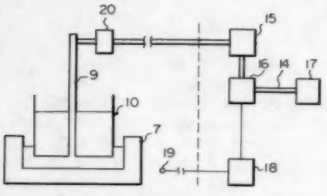
Teruto Ohta, and Yoshio Kinoshita, both of Chiba, Japan, assignors to Showa Aluminum Industries K.K., Tokyo, Japan

Filed May 19, 1981, Ser. No. 265,347

Claims priority, application Japan, May 30, 1980, 55-71549; Jul. 4, 1980, 55-90557

Int. Cl.³ C25C *3/06, 3/08, 3/14*

U.S. Cl. 204—67 **15 Claims**



1. A process for the production of aluminum comprising the steps of:

forming in a cell body an electrolytic bath in which alumina is dissolved in a fused fluoride salt bath mainly composed of cryolite;

conducting a current from a self-baking type carbon anode, which is located above said cell body, to said cell body serving also as a cathode, thereby simultaneously conducting the baking of unbaked carbonaceous raw material in the carbon anode and the electrolytic reduction of alumina;

maintaining the immersion of said carbon anode in the electrolytic bath above the molten aluminum which is formed on the cell body as a result of electrolysis;

feeding alumina in accordance with the decrease in the alumina concentration of the electrolytic bath;

introducing a gas to the lower surface of said carbon anode which is in contact with the electrolytic bath via at least one aperture passing in an essentially vertical direction through the carbon anode; and

intermittently introducing the gas from said at least one aperture to the lower surface of the carbon anode during normal operation of the cell when the alumina concentration is higher than a critical alumina concentration so that an anode effect is not generated, thereby reducing the cell voltage or increasing the inter-electrode distance of an aluminum electrolytic cell.

4,392,927

NOVEL ELECTRODE

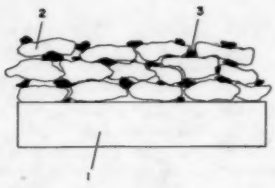
Peter Fabian, Freigericht, Fed. Rep. of Germany, and Theo Muller, Wuustwezel, Belgium, assignors to Heraeus Elektroden GmbH, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,839

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106587

Int. Cl.³ C25B *1/34, 11/04, 11/08, 11/10*

U.S. Cl. 204—98 **32 Claims**



1. A composite electrode comprising an electroconductive base with an electrolyte inert, electroconductive electrocatalytic layer applied by thermal spraying, the said layer being a powder of a matrix material selected from the group consisting of oxides, nitrides, phosphides, silicides, borides and carbides of a metal selected from the group consisting of boron, valve metals and iron group metals having uniformly admixed therewith electrocatalytically active particles of a different metal selected from the group consisting of platinum group metals and iron group metals and oxides thereof with a particle size smaller by at least one order of magnitude of the matrix particles.

4,392,928

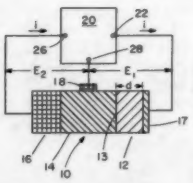
METHOD OF DOPING A SEMICONDUCTOR

Chiang Y. Yang, Miller Place, N.Y., and Robert A. Rapp, Columbus, Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,683

Int. Cl.³ C25D *5/00*

U.S. Cl. 204—130 **8 Claims**



1. A method for doping semiconductor material with a chosen impurity comprising the steps of:

(a) establishing an interface between a solid semiconductor and a solid electrolyte, forming a semiconductor/electrolyte cell, said solid electrolyte being an ionic conductor of said impurity and said semiconductor and said electrolyte being jointly chosen so that any compound formed from said semiconductor and said impurity will have a free energy of formation no lower than the free energy of formation of said electrolyte; and,

(b) establishing a potential across said interface, said poten-

tial being chosen so as to allow diffusion of impurity ions from said electrolyte into said semiconductor.

4,392,929

PREPARATION OF BIS-(1-BROMO-2,3,3-TRICHLORO-2-PROPENYL) ETHER

Junichi Saito, and Toyohiko Kume, both of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

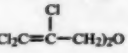
Division of Ser. No. 110,051, Jan. 7, 1980, Pat. No. 4,317,937. This application Jul. 30, 1981, Ser. No. 288,443

Claims priority, application Japan, Jan. 24, 1979, 54-6015

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 HA **4 Claims**

1. A process for producing bis-(1-bromo-2,3,3-trichloro-2-propenyl) ether, comprising reacting bis-(2,3,3-trichloro-2-propenyl) ether of the formula



with bromine under irradiation with light.

4,392,930

PHOTOPOLYMERIZABLE RESINS

Roderick D. Hathaway, Cambridge; Edward Irving, Burwell, and John S. Waterhouse, Cherry Hinton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

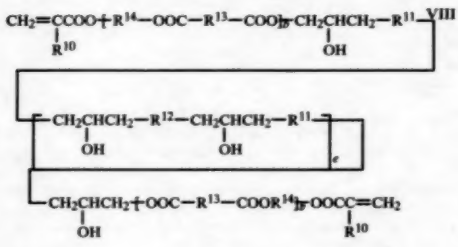
Filed Jun. 30, 1982, Ser. No. 393,894

Claims priority, application United Kingdom, Jul. 9, 1981, 8121172; Apr. 3, 1982, 8209955

Int. Cl.³ C08F *8/00, 2/46*

U.S. Cl. 204—159.14 **9 Claims**

1. A photopolymerizable resin of the formula



VIII

where

b represents zero or 1,

e is an integer of average value at least 1,

each R^{10} denotes a hydrogen atom or a methyl group,

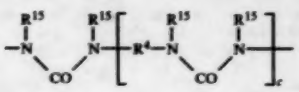
each R^{11} represents the organic divalent residue of a compound having two glycidyl groups directly attached to an atom or atoms of oxygen, nitrogen, or sulfur, after removal of the said two glycidyl groups,

each R^{12} represents the divalent residue of a dihydric alcohol, a dihydric phenol, a saturated dicarboxylic acid of 2 to 8 carbon atoms, or a compound containing two groups selected from amide groups and imide groups, after removal of two terminal hydrogen atoms attached to an oxygen or nitrogen atom or atoms,

each R^{13} denotes an alkylene group of 1 to 6 carbon atoms, an alkenylene group of 2 to 10 carbon atoms, an arylene group of 6 to 10 carbon atoms, or a cycloalkylene or cycloalkenylene group of 5 to 8 carbon atoms,

each R^{14} denotes a divalent aliphatic, cycloaliphatic, or araliphatic group of 2 to 8 carbon atoms,

with the proviso that at least 25% of the total of the (e+1) R^{11} and e R^{12} groups each represent a group of the formula



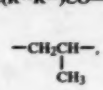
IX

where

R^4 represents a divalent aliphatic, cycloaliphatic, or araliphatic radical of 1 to 8 carbon atoms,

c denotes zero or 1, and

each R^{15} denotes an alkyl group of 1 to 4 carbon atoms or each pair of R^{15} conjointly represents a group of formula $-CH_2CH_2-$, $-C(R^{16}R^{17})CO-$,



$-CH_2CH_2CH_2-$, or $-COCO-$, wherein R^{16} and R^{17} each denote a hydrogen atom or a straight or branched alkyl group of up to 9 carbon atoms or R^{16} and R^{17} may together denote tetramethylene, pentamethylene, methylpentamethylene, or hexamethylene.

8. A method of polymerising a resin according to claim 1 which comprises subjecting a layer of the resin on a support to actinic radiation.

9. The method of claim 8 in which the resin has been applied to the support in water-borne form.

4,392,931

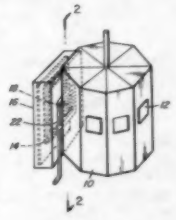
REACTIVE DEPOSITION METHOD AND APPARATUS

Shmuel Maniv, and William D. Westwood, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 31, 1981, Ser. No. 249,402

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **11 Claims**



1. Thin film deposition apparatus for reactively sputter depositing a film, the apparatus comprising a substrate, a target, means for directing sputtered target material towards the substrate, means for directing reactive gas at a present flow rate to the substrate, an apertured barrier containing a series of vertical slots intermediate the target and the substrate to limit passage of the reactive gas to the target and to control the rate at which target material reaches the substrate, whereby at said preset reactive gas flow rate to fix the composition of a film reactively deposited from the target material and the reactive gas;

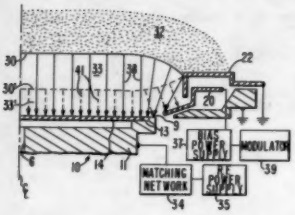
and a mounting arrangement comprising a carousel having a control axis extending in the same direction as the longitudinal extent of said slots, said substrate being contained on said mounting arrangement whereby rotation of said mounting arrangement causes a deposition area of said substrate to move past said slots to ensure uniform deposition over said deposition area.

4,392,932

METHOD FOR OBTAINING UNIFORM ETCH BY MODULATING BIAS ON EXTENSION MEMBER AROUND RADIO FREQUENCY ETCH TABLE

David J. Harra, Santa Cruz, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 12, 1981, Ser. No. 320,386
Int. Cl.³ C23C 15/00; C23F 1/00
U.S. Cl. 204—192 E 8 Claims



1. A method for obtaining a uniform etch on a semiconductor wafer being etched on an RF etch table in a plasma etch system, comprising,

placing said semiconductor wafer on said RF etch table, said table having an extension member positioned adjacent its periphery, said extension member being electrically conductive and being insulated from the structures surrounding said table,

generating a plasma above said etch table to thereby etch the surface of said wafer,

protecting the surface of said extension member from ions extracted from said plasma to prevent the generation of unwanted metallic impurities, applying a bias potential to said extension member whereby the sheath of said plasma generated above said etch table is extended beyond the periphery of said etch table and above at least a portion of said extension member, and

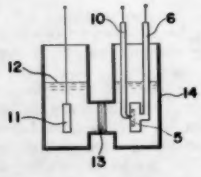
modulating said bias potential so as to produce a more uniform overall etch on said semiconductor wafer.

4,392,933

ELECTROCHEMICAL MEASURING APPARATUS COMPRISING ENZYME ELECTRODE

Kenichi Nakamura, Hirakata; Shiro Nankai, Neyagawa, and Takashi Iijima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 90,068, Oct. 31, 1979, abandoned. This application Mar. 15, 1982, Ser. No. 358,609
Claims priority, application Japan, Oct. 31, 1978, 53-134784
Int. Cl.³ C12Q 1/00, 1/26
U.S. Cl. 204—403 1 Claim



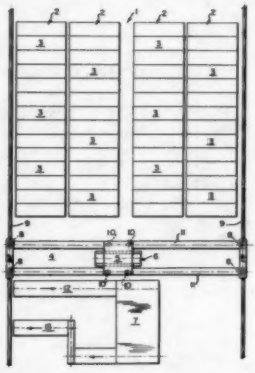
1. An electrochemical measuring system for measuring the concentration of a substrate in solution comprising a counter electrode connected to a reference electrode and a solid state enzyme electrode, said solid state enzyme electrode comprising an electron collector, a metal oxide in intimate contact with the electron collector and an oxidase immobilized onto said metal oxide, said electron collector connected to means which make it an anode, wherein said metal oxide is capable of being reduced through an oxidase reaction and oxidized electrochemically through contact with the electron collector; said system further comprising a means for applying a constant potential between said enzyme electrode and said reference electrode and comprising a means for measuring the variation of current flowing between the enzyme electrode and the counter electrode when the system is used to measure the concentration of a substrate as a result of said electrochemical reaction, said measured current corresponding to said concentration of enzyme to be measured.

4,392,934

PROCESS AND APPARATUS FOR REPLACING CATHODES

Jean F. Viellefont, Herenthout, and Robert P. L. Dierckxsens, Olen, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Jul. 10, 1981, Ser. No. 282,031
Claims priority, application Luxembourg, Jul. 21, 1980, 82645
Int. Cl.³ C25D 17/08; C25C 7/08; C25D 17/04, 17/06
U.S. Cl. 204—198 8 Claims



1. A process for replacing the cathodes of rectangular cells in an electrolytic plant in which said cells are positioned side by side in rows perpendicular to the longitudinal axes of the cells, each cell having a plurality of sequentially numbered cathodes suspended vertically at equal distance from one another and perpendicular to the longitudinal axes of the cells, wherein cathodes having an electrolytic deposit thereon are removed from said cells and replaced with cathodes from which said electrolytic deposit has been removed, comprising the steps of:

(a) lifting a first subgroup comprising the even-numbered cathodes from a first cell and simultaneously lifting a second subgroup comprising the odd-numbered cathodes from a second, adjacent cell while maintaining the orientation and disposition of said even-numbered and odd-numbered cathodes, thereby obtaining two subgroups of cathodes offset from one another along the longitudinal axes of said first and second cells over a distance equal to the distance between two adjacent cathodes;

(b) conveying said subgroups to a stripping installation while moving said subgroups perpendicular to the longitudinal axes of said cells until a collinear unstripped set of cathodes is formed from said even-numbered and odd-numbered subgroups, said stripping installation having an entry for cathodes having an electrolytic deposit thereon to be stripped and an exit for stripped cathodes;

(c) placing said collinear unstripped set of cathodes at the entry of said stripping installation;

(d) lifting a collinear stripped set of cathodes from the exit of

said stripping installation, said collinear stripped set having sequentially numbered stripped cathodes equal in number, orientation and disposition to said collinear unstripped set;

(e) conveying said collinear stripped set of cathodes to two adjacent cells while separating said collinear stripped set into a third subgroup comprising the even-numbered cathodes and a fourth subgroup comprising the odd-numbered cathodes of said collinear stripped set, said separating achieved by moving said third and fourth subgroup perpendicular to the longitudinal axes of said cells until said third and fourth subgroups are in the same relative position as the first and second subgroups of said first and second cells, respectively; and

(f) simultaneously placing the cathodes of said third and fourth subgroups in two adjacent cells, from which the respective even-numbered and odd-numbered cathodes have been removed, in the positions from which a first and a second subgroup have been removed.

4,392,935

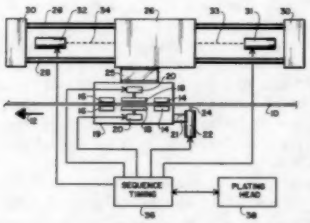
DISTRIBUTED FORCE INDEXING SYSTEM

Syed A. Hussain, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 29, 1982, Ser. No. 426,509

Int. Cl.³ C25D 17/00

U.S. Cl. 204—206 **5 Claims**



1. In a plating system that intermittently advances a web of material through plating heads that plate metal onto the web, an indexing system for intermittently moving the web comprising in combination:

shuttle means adapted for movement back and forth alongside said web;

hole engaging means connected to said shuttle means in a position to engage holes in said web;

web grasping means operable to grasp said web over a distributed area so as to avoid concentrations of force at any one spot, said grasping means also connected to said shuttle means so as to move therewith and with said hole engaging means;

shuttle moving means operable to move said shuttle with varying degrees of force; and

sequencing means connected to control said moving means so as to apply a gentle force to the shuttle when the engaging means is engaging a hole and a greater force to the shuttle after the grasping means has grasped the web.

4,392,936

DEVICE FOR THE GALVANIC DEPOSITION OF ALUMINUM

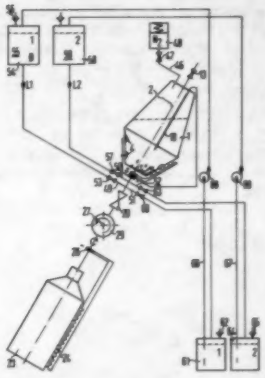
Klaus Stoeger, Nuremberg; Siegfried Birkle, Höchstadt an der Aisch, and Johann Gehring, Spardorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,567

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023405

Int. Cl.³ C25D 17/20

U.S. Cl. 204—213 **17 Claims**



1. Apparatus for the galvanic deposition of aluminum from aprotic, organoaluminum electrolytes which are free of oxygen and water, comprising a galvanizing globe which is closable so as to be gas-tight, an electrolyte container which is in spaced, adjacent relationship to said galvanizing globe and is closable so as to be gas-tight, said globe and said container being connected to one another via a closable, tubular interconnecting means which is rotatable about its longitudinal axis together with said globe and said container, and which is also counter-currently pivotable about an axis of rotation passing between said globe and said container to such an extent that a liquid electrolyte is flowable from said container through said tubular interconnecting means into said globe and vice versa.

4,392,937

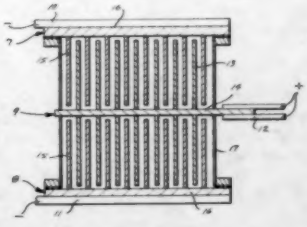
ELECTROLYSIS CELL

Helmut Schmitt; Wolfgang Strewe, both of Dortmund, and Helmuth Schurig, Holzwickede, all of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 372,099

Int. Cl.³ C25B 9/04

U.S. Cl. 204—269 **6 Claims**



1. An electrolysis cell consisting of a housing with one inlet

and one outlet for the electrolyte passing through the cell, said housing accommodating monopolar electrodes, each electrode consisting of a number of parallel plates fixed to a common carrier element, the electrodes being arranged in a staggered pattern so that the plates of one polarity extend into the gaps formed by the plates of the opposite polarity and at least one median electrode stack of one polarity with central electric power input is arranged between two electrode stacks of the other polarity, characterized in that the median electrode stack consists of a plurality of electrode plates and a power input plate of a length substantially equal to said plurality of electrode plates and a width substantially equal to that of the cell; said electrode plates being welded along one longitudinal side to said power input plate in a toothed pattern and said power input plate being joined to one side of wall of said cell housing and being provided with at least one power input connection.

4,392,938

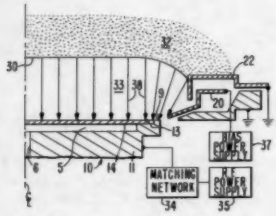
RADIO FREQUENCY ETCH TABLE WITH BIASED EXTENSION MEMBER

David J. Harra, Santa Cruz, and Frederick T. Turner, Sunnyvale, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 12, 1981, Ser. No. 320,385

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **11 Claims**



1. An RF etch table for uniformly etching a semiconductor wafer by sputtering, comprising,

a table structure adapted to receive and hold a generally circular semiconductor wafer to be subjected to sputter etching;

an RF power supply electrically connected to said table structure;

an extension member positioned adjacent the periphery of said table, said extension member being electrically conductive and being insulated from other conductive members;

a bias power supply means for applying an electrical potential to said extension member whereby the plasma generated above said table structure extends horizontally beyond the periphery of said etch table and above at least a portion of said extension member; and

a shielding member placed over said extension member, but not in electrical communication with said extension member, whereby said biased extension member is protected from unwanted sputtering to thereby avoid metallic contamination of said semiconductor wafer.

4,392,939

MAGNETRON CATHODE SPUTTERING SYSTEM

Jacobus E. Crombeen; Petrus W. H. M. Crooymans, and Jan Visser, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,948

Claims priority, application Netherlands, Mar. 5, 1982, 8200902

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **4 Claims**

1. A magnetron cathode sputtering system comprising, in an envelope, an anode and a flat cathode comprising a target in contact with a backing plate behind which means are provided to form a magnetic field near the target in the envelope, characterized in that the edge of the target is held against the edge of an aperture in the envelope in a gas-tight manner, said backing plate comprising a number of channels which communicate with the contact face of the target, the backing plate being held against the target by means of a vacuum in said channels.

4,392,940

COAL-OIL SLURRY PREPARATION

John C. Tao, Perkiomenville, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Apr. 9, 1981, Ser. No. 252,690

Int. Cl.³ C10G *1/00*; C10L *1/32*

U.S. Cl. 208—8 LE **12 Claims**

1. A process for producing a pumpable coal/oil slurry product, useful as a liquid fuel, from pulverized sulfur-containing coal which comprises the steps of:

(1) subjecting said pulverized coal to gravity separation to provide

(a) a highest density refuse portion comprising the major portion of the ash and sulfur content of the coal feed,

(b) a middlings coal portion of lower ash and sulfur content than said high density portion, and

(c) a deep-cleaned lowest density coal portion having a sulfur content of less than about 1%;

(2) subjecting said highest density refuse portion to gasification by partial combustion in oxygen

(a) thereby obtaining a crude gas product comprising hydrogen, oxides of carban, hydrogen sulfide and steam, thereafter

(b) subjecting said crude gas product to a water gas shift reaction in the presence of steam and over sulfur-resistant catalyst, to convert contained carbon monoxide to carbon dioxide with accompanying further production of hydrogen, and

(c) removing said carbon dioxide and hydrogen sulfide from the products of said shift reaction to recover a purified hydrogen-rich gas;

(3) introducing said middlings coal portion into a liquefaction zone and treating the same with a coal derived solvent and with said purified hydrogen-rich gas under conditions of elevated temperature and pressure, thereby effecting liquefaction of said middlings coal portion to produce a coal derived, benzene soluble hydrocarbon oil distillate;

(4) slurrying said deep-cleaned coal portion of lowest density from step (1) with said coal derived hydrocarbon oil of step (3) to provide said coal/oil slurry product.

4,392,941

RECOVERY OF BITUMEN FROM TAR SANDS SLUDGE USING ADDITIONAL WATER

Robert B. Roth, Woodlyn, and Walter H. Seitzer, West Chester, both of Pa., assignors to Suncor, Inc., Toronto, Canada

Filed Jun. 11, 1981, Ser. No. 272,616

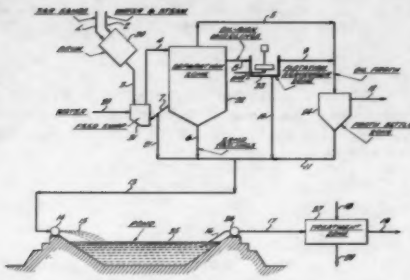
Claims priority, application Canada, Jul. 28, 1980, 357137

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—11 LE **3 Claims**

1. The method of recovering bitumen from a sludge obtained from a retention pond containing tailings from the water extraction of tar sands, which comprises diluting the sludge with water, wherein the dilution range is between about 1 part water to 10 parts sludge and about 2 parts water to one part sludge, subjecting the diluted sludge to high-shear agitation and aeration, wherein during the high-shear agitation the diluted sludge is experiencing a Reynolds Number in excess of 10,000 and settling the resulting sludge to obtain an upper

bitumen-containing froth layer and a lower sludge layer reduced in bitumen content, whereby the recovery of bitumen is



greater than that obtained with aeration and mixing with mild agitation or with aeration alone or with agitation alone.

4,392,942

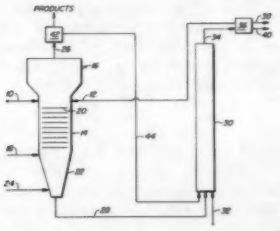
MODIFIED STAGED TURBULENT BED PROCESS FOR RETORTING CARBON CONTAINING SOLIDS

P. Henrik Wallman, Berkeley, and Byron G. Spars, Mill Valley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 187,858, Sep. 17, 1980. This application Jun. 8, 1981, Ser. No. 271,297

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—11 R **13 Claims**



13. A continuous process for retorting a particulate carbon containing solid which comprises:

passing heat transfer particles at an elevated temperature and raw carbon containing solid downwardly through a first retort zone;

passing a first stripping gas upwardly through said first retort zone;

maintaining the size of the heat transfer particles and the size of the particles of raw carbon containing solid such that a portion of the raw carbon containing solid are fluidized, and a portion of the particles of raw carbon containing solid and at least a portion of the heat transfer particles are nonfluidized in said first retort zone;

substantially limiting gross vertical backmixing and slugging of the particles within the first retort zone by passing said downwardly moving particles through a plurality of baffles in said first retort zone;

providing sufficient residence time in the first retort zone for the heavier nonfluidized particles of carbon containing solid to be substantially heated to retorting temperatures;

passing said heat transfer particles and said heated carbon containing solid particles from the bottom of said first retort zone to a second, non-fluidized, retort zone;

maintaining the particles of carbon containing solid in said second retort zone for a residence time sufficient to provide substantially complete pyrolysis of said carbon containing solids;

passing a second stripping gas through the second retort zone to strip hydrocarbonaceous vapors from the retorted solids;

withdrawing exhausted first stripping gas from the top of said first retort zone;

withdrawing exhausted second stripping gas and hydrocarbonaceous vapors from said second retort zone; and

withdrawing heat transfer particles and retorted solids from said second retort zone.

4,392,943

PROCESS AND DEVICE FOR WITHDRAWING SOLID PARTICLES AND INTRODUCING A LIQUID CHARGE AT THE LOWER PORTION OF A CONTACT ZONE

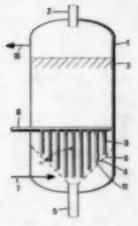
Jean-Paul Euzen, Ecully; Yves Jacquin, Sevres, both of France, and Hugo Van Landeghem, deceased, late of Oytier Saint Oblas, France by Renate Van Landeghem-Heynderickx, executor, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 29, 1982, Ser. No. 373,183

Claims priority, application France, Apr. 29, 1981, 81 08761

Int. Cl.³ C10B *31/02, 31/12*

U.S. Cl. 208—152 **16 Claims**



1. In a process for introducing into a reaction zone, containing catalyst particles, a fluid charge consisting essentially of at least one liquid and one gas of high hydrogen content, said zone having substantially an elongate and substantially vertical cylindrical shape, with the catalyst particles being introduced at the upper part of said reaction zone and progressively withdrawn from the lower part of the reaction zone after progressing downwardly through said reaction zone, with the fluid charge being introduced at least partly in the lower part of said reaction zone and withdrawn from the upper part thereof after progressing upwardly through said reaction zone, and wherein the catalyst particles are withdrawn from the lower end of at least one flared zone having the shape of an inverted cone or pyramid with the top thereof turned downwardly, the average angle between the axis of the cone or pyramid and one of the cone generatrices or one of the pyramid solid angles being from 10°–80°, the downwardly turned top having at least one opening of a size sufficient for discharging the catalyst particles, and the walls of said flared zone being substantially and regularly discontinuous by having at least a plurality of regularly spaced openings of a sufficient small size to prevent the catalyst particles from passing through said walls, but sufficiently large enough to permit passage, through said openings, of an upward stream of at least a part of the fluid charge, the improvement wherein at least a portion of the fluid charge is injected in the lower part of said reaction zone through a main pipe which is subdivided into a plurality of pipes arranged substantially vertically inside the reaction zone, and each of said pipes having orifices at the ends thereof, said orifices being located either above said walls or below said walls of said cone, or one or more orifices located above and one or more orifices located below said walls, with each orifice being located at a distance from said walls of said one at least equal to the average size of the catalyst particles fed into the reaction

zone and at most equal to about 500 times the average size of said catalyst particles.

6. In an apparatus for carrying out a process for withdrawing solid particles and introducing a liquid charge at the lowest portion of a contact zone, comprising a reactor (1), first introducing means (2) for introducing fresh catalyst at the upper part of the reactor, first discharge means for discharging used catalyst at the lower part of said reactor, with said first discharge means comprising at least one withdrawal funnel (4) of an inverted conical or pyramidal shape, with the angle between the axis of the cone or of the pyramid with one of the generatrices of the cone or one of the solid angles of the pyramid being 10°–80° and with the top of the cone or pyramid oriented downwardly, at least one opening (5) sufficiently large for permitting discharge of used catalyst from the reactor, and located at said downwardly oriented top, second introducing means (8) for introducing a fluid charge at the lower part of the reactor and second discharge means (10) for discharging a treated fluid charge from the upper part of the reactor, the walls of said withdrawing funnel (4) having perforations (6) substantially distributed over the surface of said funnel, with the size of said perforations being sufficiently small to prevent the passage of catalyst particles through said walls, but sufficiently large to provide for passage through said walls of an upward stream of at least a portion of a fluid charge introduced into the apparatus, the improvement wherein said second introducing means (8) for introducing the fluid charge comprises a plurality of substantially vertical ducts (9) provided with orifices (11) for introducing at least a portion of the fluid charge, said orifices being located either above or below, or both above and below said walls of said cone or pyramid, and at a distance from said walls of said cone or pyramid at least equal to the average size of catalyst particles to be introduced and at most equal to about 10 cm.

4,392,944
ALKALI RECYCLE PROCESS FOR RECOVERY OF HEAVY OILS AND BITUMENS

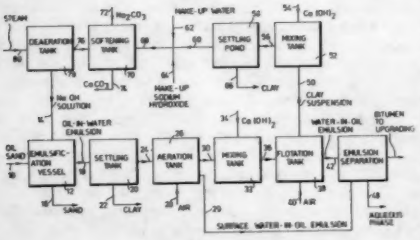
Michael A. Kessick, Edmonton, Canada, assignor to Research Council of Alberta, Edmonton, Canada

Filed Jun. 9, 1980, Ser. No. 157,935

Claims priority, application United Kingdom, Jun. 8, 1979, 7919999

Int. Cl.³ C10G *33/04*

U.S. Cl. 208—188 **11 Claims**



1. A process for the recovery of oil, which comprises:

contacting a crude oil having an API gravity value of less than 25° C. and containing groups capable of forming surfactants with water containing at least sufficient sodium hydroxide to provide a pH of the water of at least about 11 so as to form an oil-in-water emulsion having a concentration of about 10 to about 60 wt. % of the crude oil,

contacting said oil-in-water emulsion with slaked lime in an amount of about 0.02 to about 1 wt. % of the oil in said oil-in-water emulsion and sufficient to invert said oil-in-water emulsion to form a water-in-oil emulsion,

dewatering the water-in-oil emulsion to recover said oil therefrom, and

recovering an aqueous sodium medium containing at least a major proportion of said sodium hydroxide from said emulsion inversion and dewatering steps.

4,392,945
TWO-STAGE HYDROREFINING PROCESS

Kent A. Howard, and Duane A. Goetsch, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 5, 1982, Ser. No. 346,173

Int. Cl.³ C10G *45/06, 45/08*

U.S. Cl. 208—210 **11 Claims**

1. A two-stage hydrorefining process which comprises:

(a) contacting a sulfur-containing heavy hydrocarbonaceous oil feed comprising at least about 0.30 wt. % of an organic sulfur compound selected from the group consisting of dibenzothiophene, dibenzothiophene derivatives, substituted dibenzothiophene and mixtures thereof, with hydrogen in the presence of a nickel-containing hydrorefining catalyst in a first hydrorefining stage maintained at hydrorefining conditions, including a temperature ranging from about 600° to 850° F. and a total pressure ranging from about 60 to 3500 psig, to produce a first hydrorefining stage effluent, including a partially hydrodesulfurized oil, hydrogen sulfide and ammonia;

(b) removing at least a portion of said hydrogen sulfide and said ammonia from said first hydrorefining stage effluent;

(c) contacting at least a portion of the resulting hydrorefining stage effluent, including said partially hydrodesulfurized oil, with hydrogen in the presence of a cobalt-containing hydrorefining catalyst in a second hydrorefining stage to produce a hydrocarbonaceous oil having a lower sulfur content than the sulfur content of the partially desulfurized oil of said first hydrorefining stage, and

(d) recovering a hydrorefined oil having a lower content of said organic sulfur compound than said oil feed of step (a).

4,392,946
HYDRODESULFURIZATION OF HYDROCARBONS WITH FLUORIDED PLATINUM

John H. Estes, Wappingers Falls, and Sheldon Herbstman, Spring Valley, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,108

Int. Cl.³ C10G *45/10*

U.S. Cl. 208—217 **15 Claims**

1. A process for the hydrogen desulfurization of a hydrocarbon fraction comprising olefinic, aromatic and sulfur compounds comprising the step of contacting said hydrocarbon fraction with hydrogen gas and a fluorided platinum catalyst in the presence of an oxygen-containing hydrogenation moderator selected from the group consisting of water, and oxygen-containing materials which are hydrogenatable to water and whose hydrogenation products will not poison the platinum catalyst, said hydrogenation moderator being present in a quantity sufficient to minimize the saturation of the olefinic and aromatic compounds by the hydrogen gas and the fluorided catalyst.

4,392,947
INTEGRATED REFINING PROCESS

Costandi A. Audeh, Princeton, and Saverio G. Greco, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,047

Int. Cl.³ C10G *19/00, 19/02, 19/08, 45/00*

U.S. Cl. 208—229 **12 Claims**

1. A method for refining a hydrocarbon distillate fraction having sulfur-containing compounds comprising:

washing said distillate fraction with a first aqueous alkaline

solution to remove acidic materials and mercaptans that form soluble and easily removable alkaline metal mercaptides;

treating the distillate fraction resulting from said washing with a phthalocyanine catalyst in the presence of a second aqueous alkaline solution and oxygen so that the mercapto compounds contained in said fraction are oxidized to form innocuous disulfides;

incinerating spent alkaline solution resulting from said washing in the presence of oxygen and introducing a sufficient amount of sulfur-containing gas to convert the alkaline material to the corresponding sulfate.

4,392,948

PROCESS FOR REMOVING THE NITROGEN IMPURITIES FROM A HYDROCARBON MIXTURE

Guy F. S. Debande, Brussels, Belgium, assignor to Labofina, S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 155,722, Jun. 2, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,408

Claims priority, application Luxembourg, Jul. 6, 1979, 81472

Int. Cl.³ C10G *31/08, 17/06*

U.S. Cl. 208—254 R **14 Claims**

1. A process for removing nitrogen impurities from a mixture of liquid hydrocarbons containing polymerizable unsaturated hydrocarbons, which process comprises the steps of:

continuously introducing a dilute aqueous acid solution into a low volume mixer, said solution having an acid concentration of from 0.01 to 5 volume percent;

continuously introducing the mixture of liquid hydrocarbons into said mixer, the volume ratio of the amount of liquid hydrocarbons to the amount of aqueous acid solution being from about 0.3 to about 13;

forming in the mixer an emulsion of the hydrocarbons in said aqueous acid solution by mixing during a period of time not exceeding 2 seconds the acid solution and the hydrocarbons, thereby extracting the major part of the nitrogen impurities;

withdrawing the resultant emulsion into a decantation zone where the emulsion breaks and phase separation occurs;

recovering the hydrocarbon phase containing not more than 2 ppm of basic nitrogen impurities from the decantation zone;

recycling from 80 to 95% by volume of the used aqueous acid solution phase to the low volume mixer;

withdrawing the remainder of said used aqueous acid solution phase as a purge; and

adding a sufficient volume of fresh acid solution in order to maintain in the low volume mixer the volume ratio of the liquid hydrocarbon mixture to the aqueous acid solution at its initial value, the concentration of said fresh acid solution being such that the pH of the aqueous acid solution is from about 0.1 to about 1.5.

4,392,949

CONDITIONING DRUM FOR SLURRIES AND EMULSIONS

Jan Kruyer, 4643-82 Ave., Edmonton, Alberta, Canada (T6B 2L9)

Filed Aug. 14, 1980, Ser. No. 178,001

Claims priority, application Canada, Aug. 15, 1979, 333831

Int. Cl.³ B03B *1/00, 5/56;* **B03D** *3/06;* **C10G** *1/04*

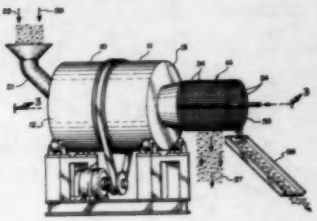
U.S. Cl. 209—5 **31 Claims**

1. A method for producing a slurry from mined oil sand consisting of a dispersed bitumen phase and a continuous aqueous phase and increasing the particles size of dispersed bitumen phase particles in said slurry which comprises the steps of

(a) introducing an oil sand into a generally horizontal rotating drum having protrusions extending inwardly from the interior thereof wherein at least a portion of said interior and inwardly extending protrusions have oleophilic surfaces,

(b) introducing concurrently with the oil sand a member selected from the group consisting of water, steam and combinations thereof into said rotating drum thereby forming an oil sand slurry containing dispersed bitumen particles

(c) causing said slurry to come into contact with the inner surface and protrusions of said drum as it rotates such that



dispersed bitumen particles adhere to the oleophilic portion of said surfaces and unite to form coatings thereon and which slough off back into said slurry in the form of larger dispersed bitumen phase particles, and

(d) removing said slurry containing said larger bitumen particles from said drum for subsequent separation of bitumen phase from the continuous aqueous phase.

4,392,950

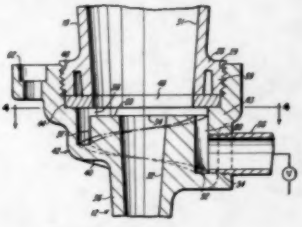
CENTRIFUGAL TYPE CLEANER

James P. Beery, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Continuation of Ser. No. 827,066, Aug. 23, 1977, abandoned. This application Feb. 23, 1982, Ser. No. 351,471

Int. Cl.³ B04C *5/14*

U.S. Cl. 209—211 **11 Claims**

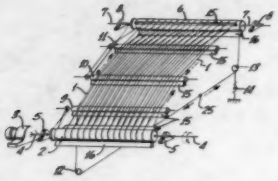


1. Apparatus for centrifugally separating and/or cleaning the solids content of a fiber pulp slurry comprising means defining an axially extended separating chamber including, at one end of said chamber, inlet means for introducing a pulp slurry in a vortex type flow pattern and a first axial outlet, said chamber means further comprising a bounding wall surface including a portion tapering toward a second axial outlet at an end opposite said one end of said chamber, a further outlet comprising an annular opening interrupting said tapering portion of said bounding wall surface, means defining a generally planar annular surface facing said one end of said chamber and presenting an obstruction to a substantial segment of said vortex flow and defining an edge portion of said annular opening remote from said one end, the inner diameter of said annular surface comprising a resumption of said tapering portion of said bounding wall surface and the outer diameter of said annular surface being at least as large as the diameter of said bounding wall surface as it tapers to said annular opening.

4,392,951
SCREEN FILTER

Toshiyuki Omori, and Kunihiro Abe, both of Kitakyushu, Japan, assignors to Kao Soap Co. Ltd., Tokyo, Japan

Filed Feb. 2, 1981, Ser. No. 230,393
Claims priority, application Japan, Aug. 20, 1979, 54-106526; Nov. 10, 1980, 55-158552
Int. Cl.[3] B01D *33/14*
U.S. Cl. 209—307 12 Claims

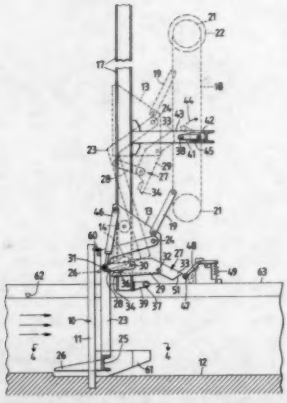


1. A screen filter comprising:
a plurality of rollers arranged in parallel, spaced relationship;
carriers positioned between said rollers with the axes of said carriers parallel to the axes of said rollers;
a wire extending past and wound spirally over said rollers and engaging the surfaces of said carriers; and
driving means for engaging at least one of said rollers for driving said wire, including means for periodically alternating, in a predetermined time cycle, the direction of driving of said wire to effectively prevent clogging thereof.

4,392,952
BAR SCREEN WITH SCREEN CLEANER FOR WASTE WATER TREATMENT INSTALLATIONS

Leonhard Fechter, Kulmbach, and Hubert Jung, Hadamar, both of Fed. Rep. of Germany, assignors to Passavant-Werke Michelbacher Huette, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,883
Int. Cl.[3] C02C *1/22*
U.S. Cl. 210—159 4 Claims

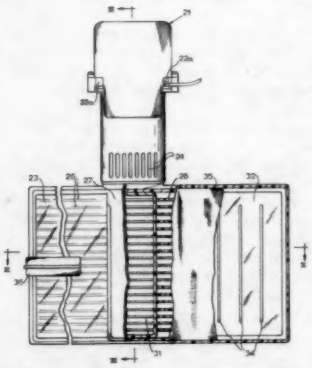


1. In a bar screen with a screen cleaner for waste water treatment installations, embodying a carriage cooperating with means for movement upwardly and downwardly in guides extending parallel to said screen, a rake for cleaning said screen pivotally connected to said carriage by pivot arms with said rake being pivotable by means of said pivot arms between a first position of engagement with said screen and a second position of disengagement with and spaced from said screen, a foldable lever assembly pivotally connected to said carriage and pivotally connected to said pivot arms and movable in a path of movement from a fully extended position to a first folded position which correspond to said first and second positions, respectively, of said rake and a lower stop means mounted in the path of movement of said foldable lever assembly, said lower stop means for engaging and moving said foldable lever assembly from said first folded position to an intermediate folded position at the end of the downward movement of said carriage and before said lever assembly reaches said fully extended position with said rake being retained in said second position of disengagement during downward movement of said carriage and being pivoted by the change of position of said lever assembly into a partially engaged position until said lever assembly is moved to said fully extended position, a stop member means mounted near the lowermost point of travel of said lever assembly for engaging and pivoting said lever assembly to its fully extended position only during upward movement and after commencement of upward movement of said carriage and after said lever assembly has been moved into said intermediate folded position by said lower stop means, said stop member means also for providing that movement of said rake into said first position of engagement with said screen is only completed after commencement of upward movement of said carriage and said rake is positively retained in the position of engagement with said screen while said lever assembly is in said fully extended position.

4,392,953
AQUARIUM FILTRATION APPARATUS

Douglas P. Cornelius, Brooklyn Park, and Charles G. Erickson, Anoka, both of Minn., assignors to Cornelius Products Inc., Brooklyn Center, Minn.

Filed Feb. 25, 1981, Ser. No. 238,072
Int. Cl.[3] E04H *3/20;* B01D *35/02*
U.S. Cl. 210—169 1 Claim



1. A power driven cleaning device for an aquarium tank having a rim, comprising:
(a) a body adapted to be suspended in the tank on the rim of the tank, and including an impeller housing portion and a filter housing portion, for both extending into the tank;
(b) a motor supported on said body above the rim;
(c) an impeller rotatably supported in said impeller housing portion and having a drive connection with said motor;
(d) said filter housing portion having a shallow rectangular nest open along its longer sides and flatwise receptive of a flat sheet of filter media;
(e) a removable cover for fixedly holding said filter media in place, said cover being rectangular and having a flat marginal portion corresponding in length and width to said longer sides of said nest and disposed in said nest for engaging one side of the flat filter media at its periphery;

(f) a plurality of spring clips embracing the edge portions of said cover and said filter housing portion;

(g) means on said cover and said body defining a flow passage leading from a water inlet through said filter media, to said impeller, to a water outlet.

4,392,954

SEWAGE VENTILATING BASIN

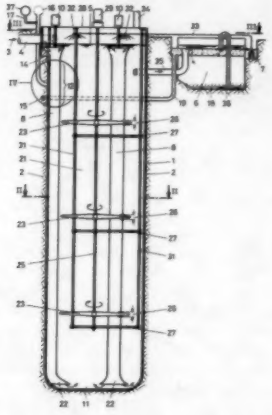
Hans Bertschinger, Dübendorf, and Alfred Scherler, Reidholz, both of Switzerland, assignors to Locher & Cie. AG, Zurich and Cellulose Attisholz AG., Luterach, both of, Switzerland

Filed Feb. 13, 1979, Ser. No. 11,890

Claims priority, application Switzerland, Feb. 16, 1978, 1717/78

Int. Cl.³ C02F 3/22

U.S. Cl. 210—195.3 7 Claims



7. A sewage ventilating basin for use in a sewage treatment plant, comprising:

a vertically elongated sewage container;

at least one substantially cylindrical tube connecting the upper, or surface-water, zone of said elongated container with the bottom, or deepest-water, zone of said container;

pump means for producing a downwardly directed flow in each said tube in order to maintain sewage circulation in the container when in use;

gas introduction means, disposed in an upper part of each said tube, for introducing fine bubbles of air or oxygen thereinto, said gas introduction means comprising at least one downwardly directed tapered wall portion in a the form of a venturi tube, and an air and/or oxygen inlet connecting piece terminating in said upper part of said tube whereby, due to the suction effect caused by the injection principle, the air and/or oxygen is introduced into the flow within said tube adjacent said venturi;

residual sludge recycling means for recycling residual sludge to said sewage ventilating basin, said residual sludge recycling means comprising a second venturi-shaped tapered wall portion in said upper part of said elongated tube, and residual sludge introduction means including a residual sludge line terminating in said upper part of said tube adjacent said second venturi-shaped tapered wall portion whereby residual sludge is caused to be sucked into the flow within said tube; and

control means for maintaining the flow velocity of the sewage, in each said tube directly below said upper part thereof, higher than the uplift velocity of the gas bubbles suspended in the flow at the same point, when in use.

4,392,955

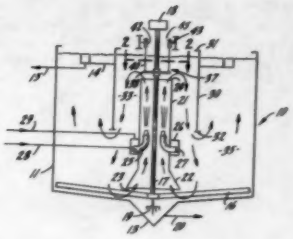
LIQUID TREATMENT APPARATUS

Alfonse J. Soriente, Gillette, N.J., assignor to Ecodyne Corporation, Union, N.J.

Filed Dec. 26, 1979, Ser. No. 107,007

Int. Cl.³ B01D 19/04; C02B 1/10

U.S. Cl. 210—195.4 5 Claims



1. Liquid treating apparatus comprising:

A. a tank having a treated liquid outlet adjacent its upper end and a settled solids outlet adjacent its bottom, a rotatable rake adjacent the bottom of said tank for moving settled solids toward said settled solids outlet, and power-driven vertical shaft means coaxial with the center of said tank connected to said rake for rotating said rake;

B. a generally circular, open-ended vertical updraft tube of predetermined diameter surrounding and coaxial with said shaft means, the lower end of said tube terminating above said rake, the upper end of said tube terminating below the upper surface of the liquid in said tank, an upwardly directed untreated liquid inlet nozzle within said tube, means connecting said nozzle to a pressurized source of untreated liquid for causing such untreated liquid from said nozzle to flow rapidly up and out of said upper end of said tube and thereby to draw settled solids into said lower end of said tube and through said tube where such solids mix with such untreated liquid;

C. generally circular baffle means surrounding and coaxial with said tube, the upper end of said baffle means extending above the upper surface of the liquid in said tank, and the lower end of said baffle means terminating above said lower end of said tube, said baffle means defining a solids mixing and recirculation zone in said tank surrounding said tube; and

D. means for controlling the amount of settled solids drawn upwardly into said tube comprising a substantially flat circular disc coaxial with said tube, said disc being constructed and arranged so that it is always positioned above and entirely outside of said tube in the flow path of liquid leaving said tube upper end, said shaft means passing through the center of said disc, and means outside of said tube for moving said disc vertically toward and away from said tube upper end, whereby the upward flow of settled solids in said tube is controlled by the vertical position of said disc outside of said tube.

4,392,956

ENCAPSULATED FRAME TYPE FILTER PRESS

George P. Vogel, Kingston, N.Y., assignor to Stavo Industries, Inc., Kingston, N.Y.

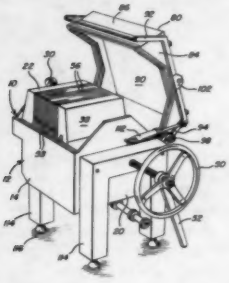
Filed Sep. 11, 1981, Ser. No. 301,219

Int. Cl.³ B01D 25/14

U.S. Cl. 210—224 8 Claims

1. An encapsulated frame-type filter press, said press including an upwardly opening tank having interconnected opposite side and end walls, a first stationary filter head mounted in one end of said tank, a second movable head mounted in the other end of said tank and adjustably shiftable toward and away from said first head, a plurality of alternating filter panels and filter

frames releasably clamped between said heads, said first head including inlet and outlet passages formed therethrough for inlet and outlet flow of fluid to be filtered to and from said filter panels and frames, a downwardly opening cover for said tank including interconnected opposite side and end walls, the lower marginal set of edges of said cover side and end walls and the upper marginal set of edges of said tank side and end walls being positionable in juxtaposed relation for closing said tank, support means swingably supporting said cover from said tank for forward and downward swinging of said cover into position closing said tank and upward and rearward swinging of said cover toward and an open position with said cover upwardly and rearwardly displaced relative to said tank and disposed in a forwardly and downwardly opening attitude, one



of said sets of edges including seal means for forming at least a generally fluid-tight seal with the other set of edges when said cover is in the closed position, said support means including a lift frame pivotably supported from said tank for oscillation relative thereto about a first horizontal axis extending longitudinally of said tank and stationary relative to said tank and frame, means supporting said cover from said frame for slight limited oscillation relative thereto about a second horizontal axis extending longitudinally of said tank, said end walls of said tank including generally isoclinal trapezoidal-shaped upper extensions and said end walls of said cover including complementary similar shape and size downwardly opening recesses in which said extensions are received when said cover is closed.

4,392,957

ANTI-POLLUTION EQUIPMENT

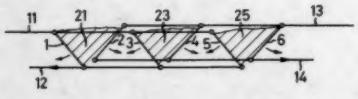
Michael G. Webb, Wootton Bridge, England, assignor to Vikoma International Limited, Isle of Wight, England

Continuation-in-part of Ser. No. 125,515, Feb. 28, 1980, abandoned. This application Jul. 10, 1981, Ser. No. 281,932

Claims priority, application United Kingdom, Mar. 6, 1979, 7907834

Int. Cl.³ B01D *17/00*

U.S. Cl. 210—241 **4 Claims**



1. A device suitable for recovering viscous material derived from petroleum comprises a plurality of pairs of blades, each blade being pivotally mounted at either end, and the pivots on at least one end being connected to an actuating rod or rods, so that the position of the pivots can be moved substantially at right angles to the width of the blades, the blades and rods being arranged to operate in such a manner that in a first position, the pairs of blades are in a vertical position, adjacent to one another but remote from other pairs, in a second position the blades form a series of V-shaped containers and in a third position the blades are again in vertical pairs, either in the same or in different pairs from the original position.

4,392,958

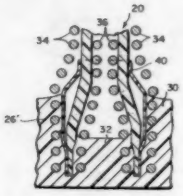
METHOD AND STRUCTURE FOR SEALING TUBULAR FILTER ELEMENTS

Gary C. Ganzi, Lexington, and Charles T. Paul, Westford, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 121,561, Feb. 14, 1980. This application Mar. 23, 1981, Ser. No. 246,803

Int. Cl.³ B01D *27/06*

U.S. Cl. 210—493.2 **7 Claims**



1. In a tubular filter element comprising a pleated microporous membrane disposed for fluid flow therethrough from its upstream side to its downstream side and having its ends sealed in solidified liquid sealer, the improvement wherein each end of the membrane on its upstream side includes a barrier strip of non-porous pleated film, one portion of the strip being joined fluid-tight to the membrane and the other portion being free from the membrane to permit relative movement therebetween, the solidified sealer terminating on the other portion of the film and sealing fluid-tight to the film and downstream side of the membrane, whereby the membrane may flex away from a portion of the strip in response to upstream pressure.

4,392,959

PROCESS FOR STERILIZATION AND REMOVAL OF INORGANIC SALTS FROM A WATER STREAM

Dudley W. Coillet, 319 Trapelo Rd., Belmont, Mass. 02178

Filed May 15, 1981, Ser. No. 263,869

Int. Cl.³ B01D *13/02*

U.S. Cl. 210—638 **31 Claims**

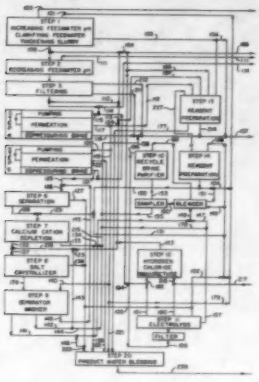
1. A process for the desalination of unpotable feedwater comprising the steps of:

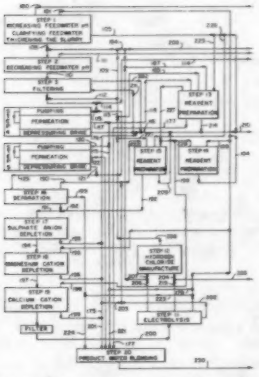
(a) decarbonating said feedwater by adding sodium hydroxide to said feedwater in a quantity sufficient to raise the pH level to at least about 9.5 but no greater than 11 to thereby convert substantially bicarbonate to carbonate and to precipitate said carbonate substantially as calcium carbonate in a sludge and a supernatant saline stream;

(b) separating the thus-formed sludge from the supernatant saline stream in a clarifier;

(c) subjecting the separated supernatant saline stream to first stage reverse osmosis across a membrane to produce a first stage permeate stream and a first stage sodium chloride brine stream, whereby multivalent cations at least are substantially rejected into the latter and a portion of the monovalent cations and of the water from the saline feed are preferentially retained as first stage permeate; and

(d) subjecting the first stage permeate stream to second stage reverse osmosis to form a second stage permeate stream of





potable water and a second stage sodium chloride brine stream.

4,392,960

PROCESS FOR THE REMOVAL OF UREA FROM AQUEOUS SOLUTIONS

Menahem A. Kraus; Moshe A. Frommer, both of Rehovot; Mara Nemas, Neve Monoson, and Rodika Gutman, Kiryat Sharet, all of Israel, assignors to A. T. Ramot Plastics, Ltd., Tel-Aviv, Israel

Filed Jan. 27, 1976, Ser. No. 652,812

Claims priority, application Israel, Jan. 27, 1975, 46510; Jul. 15, 1975, 47709

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—651 **1 Claim**

1. A process for the removal of urea from an aqueous solution containing same, wherein a removal equivalent to a rejection of at least 60% from a urea concentration of 5,000 ppm and at 600 psi operating pressure is achieved, which comprises subjecting the solution to reverse osmosis through a polymeric membrane produced from a polymer obtained by the polymerization of m-phenylenediamine, 3,3'-diamino-N,N',N''-triphenyl phosphoric triamide and isophthaloyl chloride.

4,392,961

MAGNESIUM ALUMINATE ANION EXCHANGERS

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 183,907, Sep. 4, 1980, Pat. No. 4,326,961, which is a continuation-in-part of Ser. No. 71,920, Aug. 31, 1980, Pat. No. 4,243,555, which is a division of Ser. No. 939,544, Sep. 5, 1978, Pat. No. 4,183,900, which is a division of Ser. No. 812,542, Jul. 5, 1977, Pat. No. 4,116,857. This application Mar. 22, 1982, Ser. No. 360,717

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.³ B01J *41/02*

U.S. Cl. 210—679 **7 Claims**

1. A method for removing negative-valent ions or radicals from aqueous medium, said method comprising

contacting said aqueous medium with crystalline $Mg(OH)_2.nAl(OH)_3.mH_2O$, where n is a value of from about 1 to about 2 and m is a value of zero or more, and

where the crystalline $Mg(OH)_2.nAl(OH)_3.mH_2O$ is supported by a substrate,

thereby exchanging OH ions in the said crystalline material with the said negative-valence ions or radicals.

4,392,962

PROCESS FOR SEPARATING METALS FROM AQUEOUS SOLUTIONS

Klaus Lehr, Hürth-Knapsack; Gero Heymer; Christian May, both of Erftstadt, and Hermann Klein, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,736

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042724

Int. Cl.³ C02F *1/62*

U.S. Cl. 210—688 **9 Claims**

1. A process for separating a seminoble or noble metal, from an aqueous solution having a compound of a said metal dissolved therein, which comprises: passing said solution through a column subdivided into a plurality of zones, a lower zone containing a layer of active carbon particles having a size of 0.01 to 10 mm and an upper zone containing a layer of granular red phosphorus having a size of 0.01 to 10 mm.

4,392,963

RESORCINOL OR PHLOROGLUCINOL CONDENSATION PRODUCT FOR AQUEOUS MIXTURE PURIFICATION

Horst Perl; Dietmar Nussbaumer, both of Göttingen; Horst Klüver, Dransfeld, and Hans Beer, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 245,957

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011739

Int. Cl.³ C02C *5/02*; B01D *15/00*

U.S. Cl. 210—692 **16 Claims**

1. A process for removing urea, ammonia, phenols and formaldehyde from an aqueous liquid, comprising:

contacting said aqueous liquid with an incompletely condensed phenol/aldehyde resin having a large surface area, said incompletely condensed phenol/aldehyde resin comprising a condensation product of an aldehyde and resorcinol or phloroglucinol, said incompletely condensed phenol/aldehyde resin having free methylol groups in the ortho-position relative to the phenol hydroxyl group.

4,392,964
COMPOSITIONS AND METHOD FOR THICKENING AQUEOUS BRINES

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed May 5, 1980, Ser. No. 146,286
Int. Cl.³ C09K 7/02; E21B 43/00
U.S. Cl. 252—8.5 C **12 Claims**

1. A well servicing fluid comprising:
an aqueous brine having a density of at least 11.7 ppg; and
a polymeric composition comprising from about 5 to about 30% by weight of hydroxyethyl cellulose, at least about 40% by weight of isopropanol, and from about 3 to about 40% by weight of an aqueous liquid, wherein said isopropanol, when uniformly mixed with said hydroxyethyl cellulose in a weight ratio of hydroxyethyl cellulose to organic liquid of 1:2, produces a mixture with free liquid present after remaining quiescent for one week at ambient temperature in a sealed container.

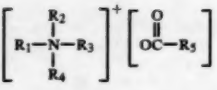
4,392,965
LAUNDRY SOFTENER ANTISTATIC COMPOSITION

Fred E. Woodward, 200 Churchill Rd., West Palm Beach, Fla. 33405, and Alice P. Hudson, 728 W. Kalmia Dr., Lake Park, Fla. 33403

Filed Nov. 12, 1981, Ser. No. 320,169
Int. Cl.³ D06M 13/46; C11D 1/52, 3/26, 3/28
U.S. Cl. 252—8.8 **13 Claims**

1. A laundry softener-antistatic composition which is a water insoluble organic salt of carboxylate anions and quaternary ammonium cations of the structure

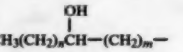
i.



wherein R_1 and R_2 are straight or branched chain alkyl or alkenyl containing 12 to 22 carbon atoms and may be the same or different, and R_3 and R_4 are methyl, ethyl, or propyl; R_5 is

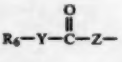
(a) straight or branched chain alkyl or alkenyl containing 10 to 22 carbon atoms, or

(b)

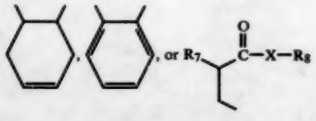


wherein n +m is about 7 to 19, or

(c)

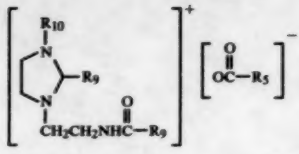


wherein R_6 is straight or branched chain alkyl or alkenyl containing 10 to 26 carbon atoms; Y is O, NH, or S, and Z is —CH=CH—, —CH_2—CH_2—,



wherein X is O or NH, R_7 is straight or branched chain alkenyl or alkyl containing 8 to 18 carbon atoms, and R_8 is straight or branched chain alkyl or alkenyl containing 10 to 22 carbon atoms; or

ii.



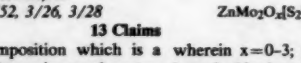
wherein R_9 is straight or branched chain alkyl or alkenyl containing 11 to 21 carbon atoms; R_{10} is methyl, ethyl, or propyl; and R_5 is as described above.

4,392,966
MOLYBDENUM-ZINC DIALKYLDITHIOPHOSPHATES AS LUBRICANT ADDITIVES

Raymond C. Schlicht, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,570
Int. Cl.³ C10M 1/54, 1/48
U.S. Cl. 252—32.7 E **11 Claims**

1. An oil soluble lubricant additive having the generic formula:



wherein x=0–3; y=6 to 12 and R is a straight-chained or branched hydrocarbyl group having from 3 to 30 carbon atoms or a mixture of at least two such hydrocarbyl groups where each group can have values ranging from 1 to 99 molar percents and whose sum equals 100.

4,392,967
PROCESS FOR CONTINUOUSLY MANUFACTURING LUBRICATING GREASE

A. Gordon Alexander, Sarnia, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 11, 1981, Ser. No. 291,944
Int. Cl.³ C10M 5/14
U.S. Cl. 252—41 **19 Claims**

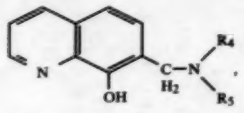
1. In the process of manufacturing a lubricating grease wherein thickener reactants, lubricating base oil and additives are combined, dispersed, reacted, dehydrated and homogenized to form the grease the improvement wherein the grease is continuously manufactured comprising:
(a) introducing thickener reactants and lubricating oil into selected locations of a screw process unit which contains a series of adjacent, longitudinally connected barrel sections for performing different operative steps and houses a rotating screw device traversing the interior of the barrel sections and having separate elements along its length to perform desired operations;
(b) mixing and conveying said reactants and lubricating oil along said process unit through the adjacent barrel sections by continuous operation of said rotating screw to form a feed mixture;
(c) controlling the temperature of said mixture while it is being conveyed through said process unit by use of various heat exchange means which are located in or adjacent each barrel to aid in carrying out the operative steps of dispersion, reaction, dehydration and homogenization;
(d) venting water resulting from the dehydration of the feed mixture at selected barrel discharge points in said process unit;
(e) homogenizing the formed grease by continued rotation of said screw device; and
(f) removing the finished lubricating grease from the end barrel section of said screw process unit.

4,392,968
METAL DEACTIVATOR AND COMPOSITION CONTAINING SAME

Noboru Ishida, Sagamihara, and Harumichi Watanabe, Yokohama, both of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

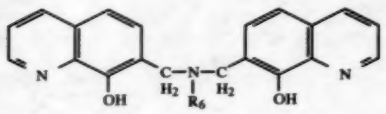
Filed Jul. 30, 1981, Ser. No. 288,343
Claims priority, application Japan, Aug. 13, 1980, 55-110391; Aug. 13, 1980, 55-110392
Int. Cl.³ C10M 1/32
U.S. Cl. 252—51.5 R 7 Claims

1. A metal deactivator comprising at least one member selected from the group consisting of compounds represented by the formula



I

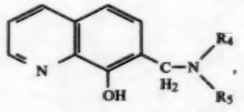
and compounds represented by the formula



II

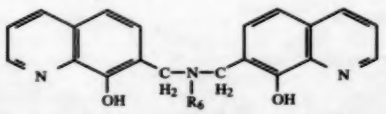
wherein R_4, R_5 and R_6 are each independently a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 2 to 20 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, an aryl group having 6 to 10 carbon atoms, an aralkyl group having 7 to 9 carbon atoms, or a group represented by the formula $R_7O(R_8O)_nR_9$ where R_7 is a hydrogen atom or an alkyl group having 1 to 20 carbon atoms, R_8 and R_9 are each an alkylene group having 2 or 3 carbon atoms and n is an integer of 0 to 4.

5. A composition comprising an oil selected from the group consisting of mineral oils and synthetic oils, said mineral oils and synthetic oils having a kinematic viscosity ranging from 10 to 10,000 cSt (40° C.) and a viscosity index ranging from 80 to 250, and 0.001% to 10.0% by weight, based on the total weight of the composition, of at least one member selected from the group consisting of compounds represented by the formula



I

and compounds represented by the formula



II

wherein R_4, R_5 and R_6 are each independently a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 2 to 20 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, an aryl group having 6 to 10 carbon atoms, an aralkyl group having 7 to 9 carbon atoms, or a group represented by the formula $R_7O(R_8O)_nR_9$ where R_7 is a hydrogen atom or an alkyl group having 1 to 20 carbon atoms, R_8 and R_9 are each an alkylene group having 2 or 3 carbon atoms and n is an integer of 0 to 4.

4,392,969
ALKYLATED 5,6,7,8-TETRAHYDRONAPHTHALENOLS AS ANTIOXIDANTS IN LUBRICATING OILS AND GREASES

Bruce E. Firth, Elk Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 8, 1981, Ser. No. 299,707
Int. Cl.³ C10M 1/20
U.S. Cl. 252—52 R 11 Claims

1. A composition comprising a lubricating oil or grease containing from about 5 ppm to about 5% by weight of an additive selected from the group consisting of dialkyl- and trialkyl-5,6,7,8-tetrahydronaphthalenols, and the dehydrocyclization products of said trialkyl-5,6,7,8-tetrahydronaphthalenols, wherein each alkyl group contains from 3 to about 16 carbon atoms.

6. The method of inhibiting oxidation in lubricating oils and greases comprising adding thereto an oxidation inhibiting amount of an additive selected from the group consisting of dialkyl- and trialkyl-5,6,7,8-tetrahydronaphthalenols, and the dehydrocyclization products of said trialkyl-5,6,7,8-tetrahydronaphthalenols, wherein each alkyl group contains from 3 to about 16 carbon atoms.

4,392,970
PIEZOELECTRIC CERAMICS

Hiromu Ouchi, Toyonaka; Masamitsu Nishida, Osaka, and Kazunori Numata, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 49,969, Jun. 19, 1979, abandoned, which is a continuation of Ser. No. 671,980, Mar. 30, 1976, abandoned, which is a continuation of Ser. No. 495,127, Aug. 5, 1974, abandoned. This application Feb. 3, 1982, Ser. No. 345,530
Claims priority, application Japan, Sep. 4, 1973, 48-100041
Int. Cl.³ C04B 35/49
U.S. Cl. 252—62.9 6 Claims

1. A piezoelectric ceramic composition exhibiting high stability of resonant frequency with respect to temperature over the range of −40° C. to 80° C. comprising a solid solution of a material selected from the area bound by lines connecting points A, B, C, D, E and F of the triangular diagram of FIG. 2, wherein A, B, C, D, E and F respectively have the following formulae:

A: $Pb(Sn_{1/3}Sb_{2/3})_{0.01}Ti_{0.75}Zr_{0.24}O_3$
B: $Pb(Sn_{1/3}Sb_{2/3})_{0.01}Ti_{0.09}Zr_{0.90}O_3$
C: $Pb(Sn_{1/3}Sb_{2/3})_{0.09}Ti_{0.01}Zr_{0.90}O_3$
D: $Pb(Sn_{1/3}Sb_{2/3})_{0.50}Ti_{0.01}Zr_{0.49}O_3$
E: $Pb(Sn_{1/3}Sb_{2/3})_{0.50}Ti_{0.495}Zr_{0.005}O_3$
F: $Pb(Sn_{1/3}Sb_{2/3})_{0.25}Ti_{0.745}Zr_{0.005}O_3$.

4,392,971
HEAT STORAGE MATERIAL

Hiroshi Kimura, and Junjiro Kai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,172
Claims priority, application Japan, May 8, 1981, 56-69619
Int. Cl.³ C09K 5/06; F24H 7/00; F24J 3/02
U.S. Cl. 252—70 3 Claims

1. A heat storage material which comprises a composition of $CaCl_2.6H_2O$ modified for preventing a crystallization of $CaCl_2.4H_2O$ and 0.01 to 3 wt.% of at least one compound selected from the group consisting of KCl, RbCl, NaCl, NaF, $NaMgF_3$, $NaYF_4$, NaY_3F_{10} and $NaThF_6$.

4,392,972

ALUMINUM-CORROSION INHIBITIVE HEAT TRANSFER FLUID

Paul H. Mohr, Chappaqua, and William N. Matulewicz, Montgomery, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1981, Ser. No. 335,614
Int. Cl.³ C23F 11/14, 11/12
U.S. Cl. 252—75 34 Claims

1. An aluminum corrosion inhibitor composition concentrate comprising;

(a) an alcohol or mixtures of water and alcohol, and

(b) a polymerizable-acid graft copolymer comprising an unsaturated grafting acid and having a percent acid graft of between about 1% and 60% and a base polymer consisting of a poly(oxyalkylene) compound of the formula: $R''(OC_nH_{2n})_zOR')_a$ wherein R' and R'' are members selected from the group consisting of a hydrocarbon radical, a hydrogen atom or an acyl radical, a is an integer having a value of 1 to about 4, n has a value of 2 to 4 inclusive, z is an integer having a value of from 4 to 800 inclusive, said base polymer having a molecular weight of between about 200 and about 10,000,

and wherein the amount of component (b) is between greater than about 0.05 wt. % and about 20 wt. % based on the total amount of component (a) plus component (b) in said concentrate.

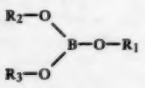
4,392,973

METHOD FOR TRANSMITTING POWER BY TRACTION UTILIZING BORATE ESTERS AS TRACTION FLUIDS AND A DEVICE FOR USING THE METHOD

Anthony J. Moore, Camberley, and Howard B. Silver, Esher, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 18, 1981, Ser. No. 245,013
Claims priority, application United Kingdom, Mar. 18, 1980, 8009018
Int. Cl.³ C09K 5/00; C10M 3/20
U.S. Cl. 252—78.1 6 Claims

1. A method of transmitting power by traction wherein a traction fluid transmits the torque between rolling elements of a drive mechanism, comprises introducing between rolling elements of a drive mechanism a traction fluid consisting essentially of a borate ester having the general formula:



where R_1 is a saturated or unsaturated mono-cyclic hydrocarbyl group which from 1 to 5 side groups having from 1 to 20 carbon atoms, and R_2 and R_3 are the same or different cyclic hydrocarbyl groups as defined for R_1 or alkyl groups with from 1 to 20 carbon atoms.

4,392,974

LOW-PHOSPHATE DETERGENT BUILDER SALT MIXTURE AND PROCESS OF WASHING

Klaus Hachmann, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,135
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852285
Int. Cl.³ C02F 1/42; C11D 3/06, 3/12, 3/20
U.S. Cl. 252—99 10 Claims

1. A builder salt mixture for washing, rinsing and cleansing agent compositions consisting essentially of:

(a) from 50% to 75% by weight of at least one water-insoluble, finely-divided, synthetic, crystalline alkali metal aluminosilicate containing at least some combined water and having primary particles in the size range of from 50μ to 0.01μ and a calcium binding power of from 50 to 200 mg CaO/gm of anhydrous active substance when measured at 22° C. by the Calcium Binding Power Test Method set out in the specification and the formula on the anhydrous basis

$$0.7\text{–}1.5\ Me_2O.Al_2O_3.1.3\text{–}4.0\ SiO_2$$

where Me is an alkali metal,

(b) from 20% to 35% by weight of at least one carboxymethyloxysuccinate selected from the group consisting of sodium carboxymethyloxysuccinate and potassium carboxymethyloxysuccinate, and

(c) from 8% to 15% by weight, based on the anhydrous salt, of a tripolyphosphate selected from the group consisting of sodium tripolyphosphate and potassium tripolyphosphate.

3. A washing, rinsing and cleansing agent composition comprising builder salts, tensides, wash alkalies, and optionally other conventional additives for washing, rinsing and cleansing agent compositions wherein

(A) said builder salts are present in an amount of from 25% to 60% by weight and consist of a builder salt mixture consisting essentially of:

(a) from 50% to 75% by weight of at least one water-insoluble, finely-divided, synthetic, crystalline alkali metal aluminosilicate containing at least some combined water and having primary particles in the size range of from 50μ to 0.01μ and a calcium binding power of from 50 to 200 mg CaO/gm of anhydrous active substance when measured at 22° C. by the Calcium Binding Power Test Method set out in the specification and the formula on the anhydrous basis

$$0.7\text{–}1.5\ Me_2O.Al_2O_3.1.3\text{–}4.0\ SiO_2$$

where Me is an alkali metal,

(b) from 20% to 35% by weight of at least one carboxymethyloxysuccinate selected from the group consisting of sodium carboxymethyloxysuccinate and potassium carboxymethyloxysuccinate, and

(c) from 8% to 15% by weight, based on the anhydorus salt, of a tripolyphosphate selected from the group consisting of sodium tripolyphosphate and potassium tripolyphosphate,

(B) said tensides are present in an amount of 5% to 20%,

(C) said wash alkalies are present in an amount of from 0 to 8% by weight of sodium silicate and from 0 to 10% by weight of other wash alkalies,

(D) said other conventional additives include from 0 to 30% by weight of sodium perborate-tetrahydrate, from 0 to 1% of organic nitrogen containing or phosphorus-containing sequestering agent and from 1% to 30% by weight of soil suspension agents, optical brighteners, enzymes, biocides, fabric softeners, dyes and perfumes, sodium sulfate and water,

with the proviso that the amount of said tripolyphosphate component (c) in said washing, rinsing and cleansing agent composition does not exceed 5% by weight.

4,392,975

ACTIVATING COMPOSITION FOR BLEACHING WITH PEROXIDE PRODUCTS

Jacques Tourdot, Paris, and Henry Carron, Pantin, both of France, assignors to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes, Paris, France

Filed Sep. 22, 1981, Ser. No. 304,586
Claims priority, application France, Apr. 9, 1981, 81 07107
Int. Cl.³ C11D 7/18, 7/36
U.S. Cl. 252—99 20 Claims

1. In an activating composition for bleaching fibers with peroxide products, containing an activator of the cyanamide

type or a derivative thereof, the improvement wherein the composition further contains a ternary protective mixture for protecting the fibers against the injurious effect of the cyanamide compound or derivative, said protective mixture comprising a finely divided magnesium silicate powder, a sequestering agent of the acetic type and a sequestering agent of the phosphonic type.

4,392,976

ENHANCING OR AUGMENTING THE AROMA OF DETERGENTS USING MIXTURES INCLUDING 4-METHYL-3-CYCLOHEXENE-1-CARBOXYLIC ACID

Nicholas Calderone, Laurel Hollow, N.Y.; Hugh Watkins, Lincroft, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

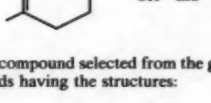
Division of Ser. No. 316,238, Oct. 29, 1981, which is a division of Ser. No. 299,211, Sep. 3, 1981. This application Jun. 24, 1982, Ser. No. 391,590

Int. Cl.³ C11D *3/50*

U.S. Cl. 252—174.11 **2 Claims**

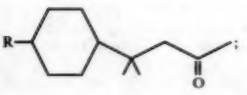
1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base, an aroma augmenting or enhancing quantity of a mixture of chemical compounds comprising:

A. the compound having the structure:



and

B. at least one compound selected from the group consisting of compounds having the structures:



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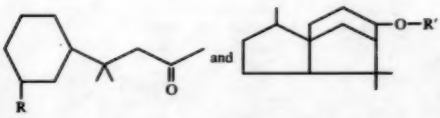


and

wherein R is selected from the group consisting of t-butyl and t-amyl and R' is selected from the group consisting of methyl, ethyl, propyl, allyl and methallyl.

4,392,977

LIQUID CLEANING AND MAINTENANCE COMPOSITION ESPECIALLY FOR DISHWASHERS

Theodor Altenschöpfer, Dusseldorf, and Klaus Schumann, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,145

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002789

Int. Cl.³ C11D *1/72, 7/50*

U.S. Cl. 252—174.19 **6 Claims**

1. A liquid, aqueous or aqueous-alcoholic cleaning and maintenance composition, especially for dishwashers, consisting essentially of:

(a) from 12% to 25% by weight of an acid having from 2 to 6 carbon atoms and having a first dissociation stage K value of $>10^{-6}$ selected from the group consisting of alkanoic acids, hydroxy substituted alkanoic acids, alkane polycarboxylic acids and hydroxy substituted alkane polycarboxylic acids,

(b) from 5% to 12% by weight of glycerol,

(c) from 1% to 5% by weight of a low-sudsing nonionic tenside,

(d) from 0 to 5% by weight of customary additives selected from the group consisting of odorants, dyes, dissolving intermediaries and corrosion inhibitors,

(e) from 0 to 30% by weight of a water-miscible alkanol having from 2 to 4 carbon atoms, and

(f) the remainder to 100% by weight of water, where the amount of water is at least 25% by weight,

based on the total weight of the composition.

4,392,978

SELECTIVE AROMATIC NITRATION

Ronald L. Elsenbaumer, Morristown, and Edel Wasserman, Summit, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 26, 1979, Ser. No. 107,235

Int. Cl.³ C09K *3/00*; C07B *11/00*; C07D *323/00*

U.S. Cl. 252—182 **10 Claims**

1. A reagent for selective aromatic nitration which comprises a complex of a nitronium containing substance and at least a catalytic amount of a macrocyclic polyether in the presence of a solvent selected from the group consisting of CH_2Cl_2, $CHCl_3$, SO_2, CH_3NO_2, CH_3CN, $(CH_2)_4SO_2$, CS_2 and polyhaloalkanes having 1 to 8 carbons.

4,392,979

MAGNESIUM ALUMINATE ANION EXCHANGERS

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to Dow Chemical Co., Midland, Mich.

Division of Ser. No. 183,907, Sep. 4, 1980, Pat. No. 4,326,961, which is a continuation-in-part of Ser. No. 71,920, Aug. 31, 1980, Pat. No. 4,243,555, which is a division of Ser. No. 939,544, Sep. 5, 1978, Pat. No. 4,183,900, which is a division of Ser. No. 812,542, Jul. 5, 1977, Pat. No. 4,116,857. This application Mar. 22, 1982, Ser. No. 360,716

Int. Cl.³ B01J *41/02*; C01F *7/02*

U.S. Cl. 252—184 **27 Claims**

1. Crystalline magnesium aluminates conforming generally to the empirical formula

$$MgA_a^vZ_b^v \cdot nAl(OH)_3 \cdot mH_2O$$

where

A and Z represent negative-valence ions or radicals selected from the group comprising hydroxyl, halide, inorganic acid, and organic acid,

n is a value of from about 1 to about 2,

v is a negative valence of 1, 2, or 3,

a is a value of from zero to 2,

b is a value of from zero to 2,

with (va)+(vb) equal to 2, and with m being a value of zero or more.

4,392,980

TRANSITION METAL ALUMINATES

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 183,908, Sep. 4, 1980, Pat. No. 4,333,846, which is a continuation-in-part of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,116,856, and a continuation-in-part of Ser. No. 95,692, Nov. 19, 1979, which is a division of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,166,856, and a continuation-in-part of Ser. No. 95,691, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,166,856. This application Mar. 29, 1982, Ser. No. 362,690

Int. Cl.³ B01D *15/04*

U.S. Cl. 252—184 14 Claims

1. Crystalline transition metal aluminates conforming generally to the formula

$$MA_a{}^vZ_b{}^v.nAl(OH)_3.mH_2O$$

where M is at least one divalent transition metal selected from the group comprising Cu, Zn, Mn, Fe, Co, and Ni,
where AZ represents negative valence ions or radicals,
n is a value of from about 1 to about 4,
v is a negative valence of 1, 2, or 3,
a and b are each values of from zero to 2,
with (va)+(vb) equal to 2, and
with m being a value of zero or more.

4,392,981

PARTIAL OXIDATION WITH RECYCLE OF RECOVERED CARBON

Roger J. Corbeels, Wappingers Falls, and Charles G. Sengenberger, Poughkeepsie, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 179,376, Aug. 18, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,367

Int. Cl.³ C10J *3/46*

U.S. Cl. 252—373 4 Claims

1. In a process for the gasification of a finely divided solid fuel entrained in a fluid medium which comprises subjecting a finely divided solid fuel ground so that at least 95% passes through a 14 mesh sieve to partial oxidation to produce a gas comprising carbon monoxide and hydrogen and containing carbon and ash bearing entrained particles and recycling said entrained particles to the partial oxidation step wherein the improvement comprises removing the entrained particles in a liquid quench medium, settling the carbon rich portion of said particles in said liquid medium, rejecting particles larger than about 0.84 mm from the settled particles and comminuting the remaining particles, subjecting the comminuted particles to froth flotation and recycling only the carbon rich float fraction to the partial oxidation step.

4,392,982

EXTENDED BIODEGRADABLE DYE PENETRANT COMPOSITION

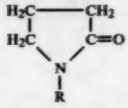
Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 24, 1981, Ser. No. 247,183

Int. Cl.³ G01N *21/88;* C09C *3/00;* B01N *33/00*

U.S. Cl. 252—408.1 17 Claims

1. A biodegradable liquid dye penetrant composition for use in nondestructive testing for detecting cracks and other defects in the surface of an object, comprising (1) a nonionic surfactant consisting essentially of an oxyalkylated aliphatic alcohol or mixtures thereof, formed of an aliphatic primary or secondary alcohol carrying ethoxy or propoxy groups, or mixtures thereof (2) a small amount of a dye soluble in said surfactant and (3) as extender, a substantial portion of an N-alkyl-2-pyrrolidone having the general formula:



where R is an alkyl group containing from 1 to 4 carbon atoms.

4,392,983

TRANSITION METAL COMPOSITION, PRODUCTION AND USE

Angus J. Hartshorn, Runcorn, and Eric Jones, Tarporley, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 21, 1981, Ser. No. 285,526

Claims priority, application United Kingdom, Jul. 21, 1980, 8023814; May 6, 1981, 8113834

Int. Cl.³ C08F *4/02, 4/44, 4/70*

U.S. Cl. 252—429 B 12 Claims

1. A process for the production of a transition metal composition which process comprises spraying a material which comprises a hot single phase liquid and cooling the spray so formed so as to obtain essentially spheroidal particles characterised in that the said single phase liquid has a composition represented by the general formula:

$$M_mX_pTY.nZ \qquad (I)$$

where
M, where present, represents at least one metal of Groups Ib, IIa, IIIb, VIIa, VIII or the lanthanide series of the Periodic Table,
X, where present, represents at least one anion,
T represents at least one transition metal of Groups IVA, VA or VIA of the Periodic Table,
Y represents at least one of the following atoms or groups: halide, oxyhalide, amino, alkoxide, thioalkoxide, carboxylate or sulphonate in an amount to satisfy the valency which T has in the composition,
Z, where present, represents at least one melt-producing compound which, on heating with the transition metal compound TY, forms a single phase liquid,
m is zero or a number less than 100;
n is zero or a number less than 8 (m+one); and

$$p \text{ is } \frac{m \times (\text{valency of } M)}{(\text{valency of } X)}$$

4,392,984

OLEFIN OLIGOMERIZATION CATALYSTS AND A PROCESS FOR THEIR PREPARATION

Heinz Engelbach; Werner Steigleiter, both of Limburgerhof, and Helmut Glietenberg, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,624

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 3014950

Int. Cl.³ B01J *21/02, 21/06, 23/18, 27/18*

U.S. Cl. 252—432 4 Claims

1. A catalyst for olefin oligomerization, whose active material has the empirical formula

$$APO_4.[P_2O_5.(H_2O)_n]_a.(XY)_b \qquad I$$

where A is boron, antimony, bismuth or 3 equivalents of titanium or mixtures thereof, X is $NH_4^{\oplus}$ or an alkali metal cation

and/or one equivalent of an alkaline earth metal cation, or mixtures thereof Y is one equivalent of an anion, a is 0.02–0.2, b is 0–0.05 and n is 1–3.

4,392,985

HYDROCARBON CONVERSION CATALYST AND METHOD OF PREPARATION

William S. Millman, Brea, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Jul. 27, 1981, Ser. No. 287,022
Int. Cl.³ B01J *27/14*
U.S. Cl. 252—435 **21 Claims**

1. A catalytic composition prepared by the method comprising the steps of (1) impregnating support particles with an aqueous impregnating solution comprising dissolved cobalt, phosphorus, and at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.01 to about 0.5, said solution having a pH less than about 1.0 and being characterized by a maximum extinction coefficient in the ultraviolet spectrum of about 0.7×10^4 to 1.8×10^4 liters/cm.moles of Group VIB metal, and (2) activating the impregnated support particles.

4,392,986

CATALYST FOR CARBOXYLIC ANHYDRIDE PRODUCTION

Tai-Cheng Yang, Mahwah; Krishna K. Rao, Paterson, and I-Der Huang, Upper Saddle River, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 309,725, Oct. 8, 1981, which is a continuation of Ser. No. 202,262, Oct. 30, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,543
Int. Cl.³ B01J *27/14*
U.S. Cl. 252—435 **31 Claims**

1. A process for preparing a catalyst composition comprising vanadium, phosphorus and oxygen capable of catalyzing the oxidation of hydrocarbons comprising:

(1) reacting in the presence of a liquid organic media, a vanadium containing compound present in said liquid organic media as a heterogeneous suspension and a phosphorus containing compound, in a manner and under conditions sufficient to form in said liquid organic media a heterogeneous vanadium-phosphorus-oxygen containing first catalyst precursor composition having an atomic ratio of phosphorus to vanadium of from about 0.5:1 to about 2:1, and an average vanadium valence of from about 3.9 to about 4.7;

(2) separating said first catalyst precursor composition from said liquid organic media;

(3) treating said first catalyst precursor composition with at least one part by weight liquid water per part by weight first catalyst precursor composition at a temperature of at least about 30° C. for a period of at least about 0.5 hour to form a second vanadium-phosphorus-oxygen catalyst precursor composition;

(4) separating said second catalyst precursor composition from said water; and

(5) activating said second catalyst precursor composition in an atmosphere which excludes the presence of air alone therein.

4,392,987

ALUMINA SPHEROIDS WITH CONTROLLED SMALL PARTICLE SIZE AND A PROCESS FOR PRODUCING THEM

Norman R. Laine, Rockville, and Jose E. Herrera, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,781
Int. Cl.³ B01J *35/08*
U.S. Cl. 252—448 **17 Claims**

1. A process for producing small spheroidal alumina particles in the size range of about 0.01 mm. to about 3.0 mm. comprising providing a slurry of an alumina and an acidic aqueous medium, spraying the slurry with an immiscible spraying fluid under nonatomizing conditions, aging the particles and drying and calcining the particles to produce alumina spheroids of small diameter.

4,392,988

METHOD OF PRODUCING STABLE ALUMINA

Jesse C. Dobson, La Jolla, and Richard W. Knight, Jr., Escondido, both of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed May 11, 1981, Ser. No. 262,230
Int. Cl.³ B01J *21/12, 20/08*
U.S. Cl. 252—455 R **10 Claims**

1. A method of treating activated alumina to impart increased chemical stability and heat resistance thereto comprising

soaking activated alumina in silicone liquid to impregnate said activated alumina therewith,

draining excess silicone liquid from said activated alumina, and

heating said silicone liquid impregnated activated alumina in an oxygen-free atmosphere to between about 350° C. and about 1100° C. to leave a silica residue infused in the crystallite structure resulting in a silica-alumina phase over the internal and external structure of said alumina.

2. A method according to claim 1 in which said activated alumina having said silica residue is further heated in the presence of oxygen to burn off carbon residue at a temperature below the α-phase conversion temperature of activated alumina.

4,392,989

ZINC-GALLIUM ZEOLITE

Yung F. Chu, and Arthur W. Chester, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 11, 1981, Ser. No. 262,280
Int. Cl.³ B01J *29/30*
U.S. Cl. 252—455 Z **6 Claims**

1. A catalyst composition comprising by weight between about 0.1 and about 2 percent of gallium, between about 0.05 and about 8 percent of zinc, and a crystalline zeolite characterized by a constraint index within the approximate range of 1 to 12, and a silica to alumina ratio of at least 12.

3. The catalyst composition of claim 1 wherein said catalyst is composited with a porous matrix material in a proportion of between about 1 and about 90 percent by weight of catalyst composition in the dry composite.

4,392,990

HEATING SILICA GEL IN INERT ATMOSPHERE BEFORE ACTIVATION

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 20, 1982, Ser. No. 340,937
Int. Cl.³ B01J *21/06, 23/26*
U.S. Cl. 252—458 **24 Claims**

1. A process comprising:

forming a silica hydrogel;

aging said hydrogel for a time of at least one hour;

treating the thus aged hydrogel with a volatile normally liquid saturated aliphatic alcohol having a solubility in water of less than 6 grams per 100 grams of water to convert said hydrogel to a xerogel;

subjecting the thus formed xerogel to a heat treatment in an inert atmosphere at an elevated temperature; and

activating the thus heat treated xerogel, said xerogel also containing chromium, in an oxygen-containing ambient for a time sufficient to activate same.

3. A method according to claim 1 wherein said alcohol is a C_5 or C_6 alcohol.

5. A method according to claim 1 wherein said inert atmosphere comprises nitrogen and wherein said heat treatment in said nitrogen is carried out for a time within the range of 15 minutes to 1 hour at a temperature within the range of 800° to 1600° F.

4,392,991

METHOD OF MAKING α-HEMATITE CATALYST

Lymperios N. Yannopoulos, Churchill, and Joseph F. Pierre, West Deer, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1981, Ser. No. 303,807
Int. Cl.³ B01J *21/04, 23/74*
U.S. Cl. 252—466 J **4 Claims**

1. A method of making an alpha hematite catalyst comprising

(A) forming a mixture of ferric oxide and an inert metal oxide support;

(B) placing said mixture in a reaction vessel;

(C) heating said mixture to a temperature of 900° to 1,000° C.;

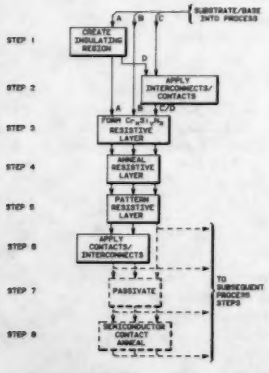
(D) passing a hydrogen halide gas over said mixture, whereby said ferric oxide forms a ferric halide which reacts with water vapor to reform ferric oxide as alpha hematite in said mixture.

4,392,992

CHROMIUM-SILICON-NITROGEN RESISTOR MATERIAL

Wayne M. Paulson, Paradise Valley, and David W. Hughes, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1981, Ser. No. 279,130
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—512 **3 Claims**



1. A resistor material comprising Cr, Si, and nitrogen in atomic percent proportions in the range 5% to 75% Cr, 5% to 85% Si, and 1% to 60% nitrogen.

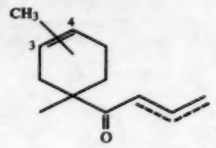
4,392,993

ALICYCLIC UNSATURATED COMPOUNDS, THEIR PREPARATION AND USE OF SAME AS PERFUME INGREDIENTS

Alan F. Thomas, Borex/VD, and Ferdinand Näf, Geneva, both of Switzerland, assignors to Firmenich, SA, Switzerland

Filed Jul. 23, 1981, Ser. No. 286,269
Claims priority, application Switzerland, Aug. 22, 1980, 6342/80
Int. Cl.³ A61K *7/46*; C11B *9/00*
U.S. Cl. 252—522 R **7 Claims**

1. A compound of formula



(I)

possessing a methyl group attached to the carbon atom at position 3 or 4 of the ring and one double bond in one of the positions of the carbonyl side chain as indicated by the dotted line.

4,392,994

CORROSION INHIBITOR FOR CELLULOSIC INSULATION

Anthony P. Wagener, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

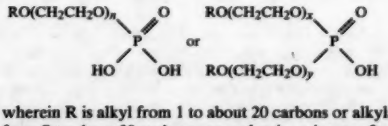
Filed Oct. 29, 1980, Ser. No. 202,031
Int. Cl.³ C09K *3/00*; C23F *11/00*
U.S. Cl. 252—602 **11 Claims**

1. A process for limiting the corrosive nature of cellulosic insulation which has been treated with a fire-retardant composition, by applying to the insulation an effective amount of an aqueous corrosion inhibiting solution which comprises:

(a) about 1.0 to about 99 parts water;

(b) about 0.01 to about 10 parts of at least one amine or alkali metal salt of an aromatic triazole;

(c) about 1 to about 99 parts of at least one amine or alkali metal salt of an organic phosphate ester acid; wherein the acid is selected from the group of acids having the formulas:



wherein R is alkyl from 1 to about 20 carbons or alkylaryl from 7 to about 30 carbons, or aryl; n is an integer from 1 to 50, x is an integer from 1 to 50 and y is an integer from 1 to 50.

4,392,995

MOLTEN TIN REPROCESSING OF SPENT NUCLEAR FUEL ELEMENTS

Richard A. Heckman, Castro Valley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

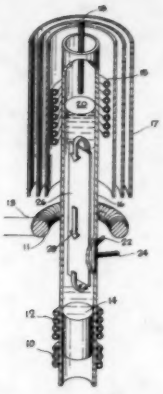
Filed Dec. 19, 1980, Ser. No. 218,242
Int. Cl.³ G21C *19/48*
U.S. Cl. 252—627 **7 Claims**

1. A method for reprocessing spent nuclear fuel in an apparatus having liquid tin dispersed within a containment vessel, and a solid plug of tin and nitride precipitates disposed within said containment vessel to interface with and support said liquid tin therein, comprising:

feeding spent nuclear fuel into said containment vessel;

immersing said spent nuclear fuel in said liquid tin under an atmosphere of nitrogen, resulting in the formation of nitride precipitates from said nuclear fuel, whereby said nitride precipitates are dispersed throughout said liquid tin;

solidifying a layer of liquid tin and nitride precipitates which interfaces with said plug, to thereby integrate said layer with said plug;



melting an end portion of said plug remote from an end of said plug which interfaces with molten tin, whereby said melted end portion may be removed, while leaving a sufficient amount of said plug solidified to provide support for said liquid tin and nitride precipitates remaining in said containment vessel; and

removing said melted portion of said plug from said containment vessel.

4,392,996

PROCESS FOR THE PREPARATION OF BIOLOGICALLY ACTIVE PEPTIDE ANALOGUES

Ludwig A. Sternberger, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,910

Int. Cl.³ C07G 7/00

U.S. Cl. 260—112 R **5 Claims**

1. A process for obtaining a neuropeptide analogue from brain or other organ of the body comprising adding a neuropeptide to brain or other organ of the body, the neuropeptide being present in an amount sufficient to displace the neuropeptide analogue from brain or other organ of the body, and isolating the neuropeptide analogue.

4,392,997

ANTIGENIC PEPTIDE COMPOUNDS

Erwin Goldberg, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 280,295, Jul. 6, 1981, abandoned. This application Jun. 16, 1982, Ser. No. 389,040

Int. Cl.³ C07C 103/52

U.S. Cl. 260—112.5 R **6 Claims**

1. The antigenic peptide compounds arranged in a sequence from N-terminal to C-terminal amino acids selected from the class consisting of:

(a) Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys

(b) Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys—Leu

(c) Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys—Leu—Ser

(d) Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys—Leu—Ser—Arg

(e) Cys—Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys

(f) Cys—Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys—Leu

(g) Cys—Glu—Gln—Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys—Leu—Ser, and

(h) Cys—Glu—Gln'Leu—Ile—Gln—Asn—Leu—Val—Pro—Glu—Asp—Lys—Leu—Ser—Arg

wherein Gly represents glycine, and Glu, Gln, Leu, Ile, Asn, Val, Pro, Asp, Lys, Ser, Arg, and Cys, respectively represent the L-amino acid forms of glutamic acid, glutamine, leucine, isoleucine, asparagine, valine, proline, aspartic acid, lysine, serine, arginine, and cysteine.

4,392,998

ONE POT DIAZOTIZATION, COUPLING AND QUATERNIZATION OF AMINOTRIAZOLES

Hans-Peter Kühlthau, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

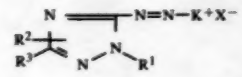
Filed Feb. 23, 1981, Ser. No. 236,490

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009267

Int. Cl.³ C07C 107/00; C09B 43/00

U.S. Cl. 260—146 R **6 Claims**

1. In the preparation of a quaternized dyestuff of the formula



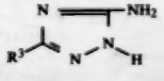
in which

R^1 and R^2 each is a C_1- to C_4-alkyl or alkenyl radical, or a C_1–C_4-alkyl or alkenyl radical substituted by halogen, hydroxyl, cyano, C_1- to C_4-alkoxy, C_1- to C_4-alkoxycarbonyl, C_1–C_3-alkylcarbonyloxy, aminocarbonyl, phenoxy, benzyloxy, benzoyloxy, mono- or di-(C_1 to C_2-alkyl)-amino, mono- or di-(C_1- to C_2-alkyl)-aminocarbonyl, phenylalkyloxy, phenoxycarbonyloxy or phenylaminocarbonyloxy; a benzyl, α- or β-phenethyl or α-, β- or γ-phenylpropyl radical; or a benzyl, α- or β-phenylethyl or α-, β- or γ-phenylpropyl radical substituted by C_1- to C_4-alkyl or by any of the substituents set forth in connection with alkyl;

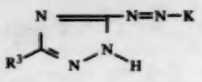
R_3 is hydrogen; a C_1- to C_4-alkyl radical; a C_1- to C_4-alkyl radical substituted as in R^1 and R^2; a cyclohexyl, phenyl, naphthyl, benzyl, α- or β-phenylethyl or α-, β- or γ-phenylpropyl radical; or a cyclohexyl, phenyl, naphthyl, benzyl, α- or β-phenylethyl or α-, β- or γ-phenylpropyl radical substituted by C_1 to C_4-alkyl or by any of the substituents set forth in connection with alkyl;

K is the radical of a coupling component HK, and X is an anion,

wherein an aminotriazole of the formula



is diazotized and coupled to a coupling component HK to form an intermediate dyestuff of the formula



and the intermediate dyestuff is quaternized with an alkylating or aralkylating agent capable of providing the radicals R^1 and R^2 in a medium also providing the anion X^-, the improvement which comprises effecting the coupling at a pH of 4 to 6 and thereafter, without isolation of the intermediate dyestuff, effecting the quaternization.

4,392,999

MONOAZO PIGMENTS CONTAINING HYDROXYNAPHTHOYLAMINO BENZIMIDAZOLONE RADICAL

Rolf Müller, Aesch; Armand Roueche, Bottmingen; Paul Müller, Basel, and Karl Ronco, Richen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

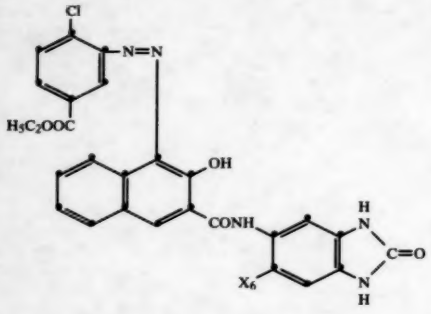
Continuation of Ser. No. 147,817, May 8, 1980, abandoned, which is a continuation of Ser. No. 911,002, May 30, 1978, Pat. No. 4,229,344. This application Sep. 14, 1981, Ser. No. 301,807

Claims priority, application Switzerland, Jun. 3, 1977, 6868/77

Int. Cl.³ C09B *29/36;* **C09B** *43/12;* **D06P** *1/52, 1/649*

U.S. Cl. 260—157 **3 Claims**

1. A monoazo pigment corresponding to the formula



wherein X_6 is hydrogen or methyl.

4,393,000

CYCLIZATION PROCESS FOR PRODUCING AZIRIDINE-2-CARBOXYLIC ACID OR ITS SALTS

Ryuichi Mita, Kawasaki; Chojiro Higuchi, Kamakura; Toshio Kato, Kawasaki; Nobuyuki Kawashima; Akihiro Yamaguchi, both of Kamakura; Shosuke Nagai, Yokohama, and Takao Takano, Fujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 9, 1980, Ser. No. 214,728

Claims priority, application Japan, Dec. 12, 1979, 54/160351; Dec. 25, 1979, 54/167681; Jan. 16, 1980, 55/2566

Int. Cl.³ C07D *203/02, 203/08*

U.S. Cl. 260—239 E **13 Claims**

1. A process for producing aziridine-2-carboxylic acid salt which comprises a step wherein an α-halogeno-β-aminopropionitrile-containing reaction mixture obtained by reacting an α,β-dihalogenopropionitrile or an α-halogenoacrylonitrile with ammonia in water, an organic solvent or a mixture of water and an organic solvent at a temperature of −40° to 30° C., is treated with an alkali or alkaline earth metal hydroxide.

4,393,001

INTERMEDIATES FOR PRODUCTION OF 1,1-DIOXOPENICILLANOYLOXYMETHYL 6-(2-AMINO-2-PHENYLACETAMIDO)PENICILLANATES

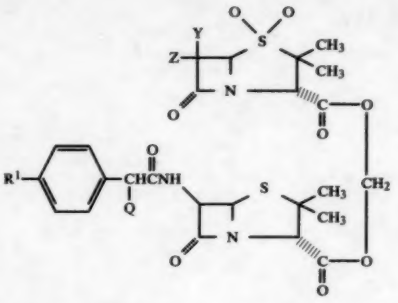
Vytautas J. Jasys, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 246,456, Mar. 23, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,215

Int. Cl.³ C07D *499/32*

U.S. Cl. 260—239.1 **10 Claims**

1. A compound of the formula



wherein

R^1 is H or OH;

Y and Z are each Cl, Br or I, or Y is H and Z is Cl, Br or I and

Q is N_3 or $NHCO_2CH_2C_6H_4R^4$ where R^4 is H, Cl, Br, NO_2, CH_3 or OCH_3.

4,393,002

ε-CAPROLACTAM BLOCKED DIISOCYANATES

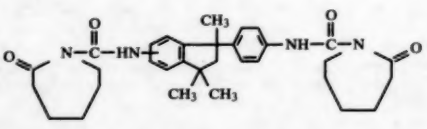
Jonas Weiss, Port Chester, and Raymond Seltzer, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 19, 1982, Ser. No. 360,031

Int. Cl.³ C07D *210/00*

U.S. Cl. 260—239.3 R **3 Claims**

1. A ε-caprolactam-blocked diisocyanate isomeric mixture corresponding to the formula



said mixture comprising from about 10 to 80% of the 5-isomer and from about 90 to 10% of the 6-isomer.

4,393,003

β-LACTAMASE INHIBITORS

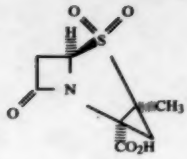
Dennis D. Keith, Montclair; John P. Tengi, Cedar Grove, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 8, 1981, Ser. No. 252,106

Int. Cl.³ C07D *499/00;* **A61K** *31/425*

U.S. Cl. 260—245.2 R **6 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof.

4,393,004

3-[(α-SUBSTITUTED-BENZYL]-2,3,DIHYDRO-THIAZOLO[3,2-A][1,3]DIAZACYCLAN-3-OL DERIVATIVES

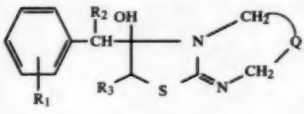
Andrew S. Tomcufcik, Old Tappan; William B. Wright, Jr., Woodcliff Lake, both of N.J., and Joseph W. Marsico, Jr., Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 206,803, Nov. 14, 1980, Pat. No. 4,340,734. This application Jan. 29, 1982, Ser. No. 344,118

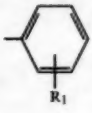
Int. Cl.³ C07D *513/04*

U.S. Cl. 260—245.5 **26 Claims**

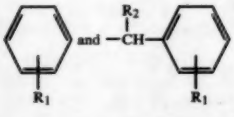
1. A compound selected from those of the formula:



wherein R_1 is hydrogen, fluoro, chloro, bromo, alkyl having from 1 to 3 carbon atoms or alkoxy having from 1 to 3 carbon atoms; R_2 is hydrogen or



wherein R_1 is as hereinbefore defined; R_3 is hydrogen, alkyl having from 1 to 3 carbon atoms, or a moiety selected from the group consisting of those of the formulae:

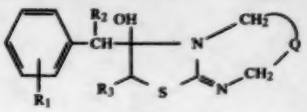


wherein R_1 and R_2 are as hereinbefore defined, and Q is a divalent moiety selected from the group consisting of those of the formulae:

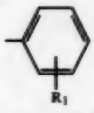
$$-(CH_2)_2- \text{ and } -CH=CH-$$

as well as the pharmaceutically acceptable salts thereof.

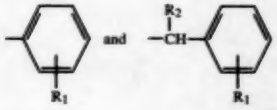
20. A compound selected from those of the formula:



wherein R_1 is hydrogen, fluoro, chloro, bromo, alkyl having from 1 to 3 carbon atoms or alkoxy having from 1 to 3 carbon atoms; R_2 is hydrogen or



wherein R_1 is as hereinbefore defined; R_3 is hydrogen, alkyl having from 1 to 3 carbon atoms, or a moiety selected from the group consisting of those of the formulae:



wherein R_1 and R_2 are as hereinbefore defined, and Q is $-(CH_2)_3-$, as well as the pharmaceutically acceptable salts thereof.

4,393,005

CATIONIC PHTHALOCYANINE DYES

Manfred Patsch, Wachenheim; Manfred Ruske, Ludwigshafen, and Erwin Hahn, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

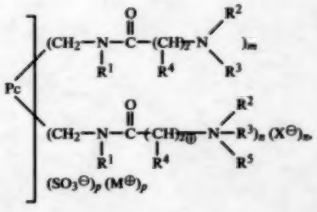
Filed Mar. 15, 1982, Ser. No. 357,808

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111199

Int. Cl.³ C09B *47/04*

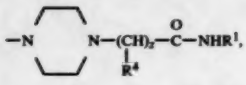
U.S. Cl. 260—245.73 **9 Claims**

1. A cationic phthalocyanine dye of the formula



where Pc is an (n+m+p)-valent radical of a phthalocyanine, R^1 is hydrogen or C_1–C_4-alkyl, R^2 and R^3 independently of one another are C_1–C_{14}-alkyl, C_2–C_4-hydroxyalkyl, C_5–C_8-cycloalkyl, benzyl, phenyl or tolyl, or

is a pyrrolidine, imidazole, 2-ethyl-4-methylimidazole, morpholine, piperazine or N'—C_1–C_4-alkylpiperazine radical, or is



R^4 is hydrogen or methyl, R^5 is C_1–C_{12}-alkyl, C_2–C_4-hydroxyalkyl, chlorine-substituted C_2–C_4-hydroxyalkyl or benzyl, $X^{\ominus}$ is one equivalent of an anion, $M^{\oplus}$ is one equivalent of a cation, z is a 1 or 2, p is 0 or 1, m is 0 or 1 and n is 1, 2, 3 or 4, and $1<(m+n)<4$.

4,393,006

DIAZIDOSULFONYL-N-SUBSTITUTED ANILINE

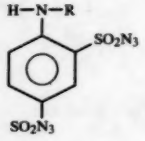
Charles E. Hoyle, and Ronald S. Lenox, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 7, 1982, Ser. No. 396,016

Int. Cl.³ C07C *161/00*

U.S. Cl. 260—349 **8 Claims**

1. A compound having the formula



wherein R represents C_1–C_{15} alkyl, C_2–C_{15} unsaturated alkyl, C_3–C_{15} cycloalkyl, aryl or a heterocyclic radical.

4,393,007

PROCESS FOR THE MANUFACTURE OF ANTHRAQUINONE COMPOUNDS

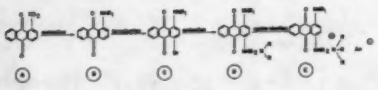
Martin Priester, Dornach, and Peter Loew, Münchenstein, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 946,281, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 812,284, Jul. 1, 1977, abandoned. This application Jan. 28, 1980, Ser. No. 115,815

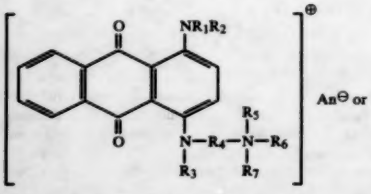
Claims priority, application Switzerland, Jul. 7, 1976, 8701/76; Jul. 7, 1976, 8702/76

Int. Cl.³ C07C *97/24*

U.S. Cl. 260—378 **13 Claims**



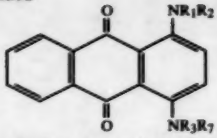
1. A process for the manufacture of quaternized anthraquinone or anthraquinone of the formula I



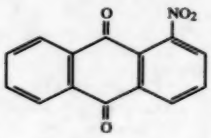
(I)

An$^{\ominus}$ or

-continued



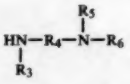
wherein each of R_1 and R_2 independently represents hydrogen, alkyl or cycloalkyl, R_3 represents hydrogen or alkyl, R_4 represents alkylene or cycloalkylene, R_5 and R_6 represents alkyl, aryl or aralkyl, R_7 represents alkyl, aralkyl, aryl or cycloalkyl, and An represents an anion which comprises the steps of, (1) reacting in an aprotic solvent at temperatures of 80° to 150° C., an α-nitro-anthraquinone (A) of the formula II



(II)

with an amine of the formula

to give 1-amino-anthraquinone (B), wherein R_1 and R_2 have the meaning given above, (2) halogenating said compound (B) by diluting the reaction mixture with a protic solvent and introducing a bromine/methanol mixture at −20° to +70° C. to give 1-amino-4-bromo-anthraquinone (C), (3) condensing said compound (C) after neutralization with a diamine of the formula



or with an amine of the formula HN-R_3R_7 at 60° to 100° C. in presence of a heavy metal salt to give 1,4-diamino-anthraquinone (D), wherein R_3, R_4, R_5, R_6 and R_7 have the meaning given above, and (4) optionally subsequently quaternizing said compound (D) to give the corresponding quaternized anthraquinone, and carrying out the reaction steps (1) to (4) or (1) to (3) in one single operation without isolation of the intermediates (B), (C) and (D) or (B) and (C).

4,393,008

2-CYANO-2-(3-PHENOXY-PHENYL)-PROPIONIC ACID AMIDE AND PREPARATION THEREOF

Endre Palosi; Gergely Heja; Dezsö Korbonits, , assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

Division of Ser. No. 105,988, Dec. 21, 1979, Pat. No. 4,304,930. This application Aug. 12, 1981, Ser. No. 292,194

Claims priority, application Hungary, Dec. 29, 1978, CI 1894; Oct. 25, 1979, CI 1979

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ C07C *121/78*

U.S. Cl. 260—465 D **7 Claims**

1. A process for the preparation of 2-cyano-2-(3-phenoxy-phenyl)-propionic acid amide which comprises the steps of:

(a) reacting m-phenoxy-benzyl cyanide with a C_1 to C_6 dialkyl carbonate in the presence of a basic catalyst to

obtain a 2-cyano-2-(3-phenoxy-phenyl)-acetic acid C_1 to C_6 alkyl ester;

(b) methylating the 2-cyano-2-(3-phenoxy-phenyl)-acetic acid C_1 to C_6 alkyl ester to yield a 2-(3-phenoxy-phenyl)-2-cyano-propionic acid C_1 to C_6 alkyl ester; and

(c) reacting the 2-(3-phenoxy-phenyl)-2-cyano-propionic acid C_1 to C_6 alkyl ester with a compound suitable for the introduction of an amino group into the molecule to yield the desired product.

7. 2-cyano-2-(3-phenoxy-phenyl)-propionic acid amide.

4,393,009

PROCESS FOR THE PREPARATION OF AROMATIC DICARBOXYLIC ACID DICHLORIDES

Dieter Freitag; Ludwig Bottenbruch, and Claus Wulff, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,898

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926736

Int. Cl.³ C07C *51/60*

U.S. Cl. 260—544 K 2 Claims

1. A process for preparing an aromatic dicarboxylic acid dichloride which comprises reacting at least one aromatic dicarboxylic acid selected from the group consisting of isophthalic acid and terephthalic acid in one stage with phosgene in the presence of a solvent or diluent and at a temperature of 110° to 180° C. in the presence of 0.2 to 3% by weight, based on said aromatic dicarboxylic acid, of an N-alkylpiperidine, N-alkyl-pyrrolidine or N-alkyl-morpholine, each said alkyl moiety having 1 to 6 carbon atoms.

4,393,010

NUCLEOSIDIC PHOSPHORYLATING AGENT AND METHODS

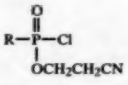
Roberto Crea, Burlingame, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 107,055, Dec. 26, 1979, Pat. No. 4,310,662. This application Aug. 20, 1981, Ser. No. 294,689

Int. Cl.³ C07F *9/02*

U.S. Cl. 260—940 3 Claims

1. A compound of structure



where R is a base labile phenyloxy protecting group.

2. A compound according to claim 1 wherein R is selected from the group consisting of p-chlorophenyloxy, o-chlorophenyloxy, 2,4-dichlorophenyloxy, p-nitrophenyloxy and p-methoxyphenyloxy groups.

4,393,011

METHOD FOR THE PREPARATION OF FLUORINE-CONTAINING PHOSPHONATES AND PHOSPHONIC ACIDS

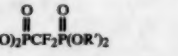
Donald J. Burton, Iowa City, Iowa, and Richard M. Flynn, Bethesda, Md., assignors to University of Iowa Research Foundation, Iowa City, Iowa

Division of Ser. No. 143,995, Apr. 28, 1980, Pat. No. 4,330,486. This application Mar. 8, 1982, Ser. No. 355,481

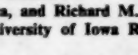
Int. Cl.³ C07F *9/32*

U.S. Cl. 260—970 1 Claim

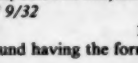
1. A method of making a compound having the formula



comprising reacting a compound of the formula:



with a compound of the formula:



wherein R and R′ are alkyl from 1 to 6 carbon atoms, M is alkali metal and X is halogen selected from the group consisting of chlorine, bromine and iodine.

4,393,012

TEMPERATURE-RESPONSIVE CONTROL DEVICE FOR CARBURETOR

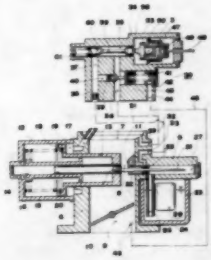
Takashi Kato, Mishima, and Masaharu Hayakawa, Tokai, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 31, 1981, Ser. No. 336,081

Claims priority, application Japan, Mar. 9, 1981, 56-32529

Int. Cl.³ F02M *1/12*

U.S. Cl. 261—39 A 5 Claims



1. A temperature-responsive control device for carburetor having a case attached to said carburetor, a heat-generating body disposed in said case, a thermo-wax disposed to oppose to said heat-generating body across a heat-mass and an actuating rod connected to said thermo-wax, wherein the improvement comprises that the portion of said heat-mass opposing and contacting said heat-generating body is protruded in an annular form.

4,393,013

VAPOR MASS FLOW CONTROL SYSTEM

Joseph C. McMenamin, Fresno, Calif., assignor to J. C. Schumacher Company, Oceanside, Calif.

Continuation of Ser. No. 151,741, May 20, 1970, abandoned. This application Jul. 30, 1981, Ser. No. 288,360

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—64 B 9 Claims

1. A method for improving the accuracy in supplying a continuous uniform mass flow of vaporized material from a chemical vapor delivery system which includes a container partially filled with material to be vaporized and applied to a vapor using system, said container being at substantially atmospheric pressure, means for ducting a carrier gas through said material to transport said vaporized material, a valve for controlling the flow of said carrier gas to said container, and means for controlling the temperature of the material in said container, said method comprising:

sensing the relatively small deviation from nominal atmospheric pressure of the total gaseous pressure in said con-

tainer, which includes pressure variations therein caused by conditions downstream from the container;

generating a signal utilizing said pressure deviation;

transmitting said signal to said flow control valve, said signal adjusting said flow control valve to control the carrier gas flow to provide said continuous, uniform mass flow of said vaporized material with reduced error in said mass flow which would otherwise be caused by said pressure deviation.

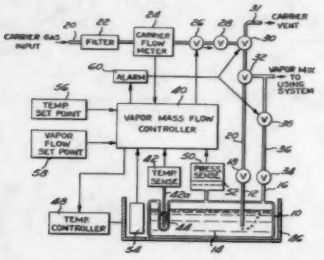
5. A chemical vapor delivery system comprising:

a bubbler container for holding a quantity of high purity liquid to be vaporized and applied to a using system, said container being at substantially atmospheric pressure;

means for transporting a carrier gas through said liquid to transport the vaporized material to the using system;

means for sensing the carrier gas flow rate;

valve means for controlling the flow of said carrier gas;



means for sensing and controlling the temperature of said liquid;

means for sensing the total gaseous pressure in said container which includes pressure variations therein caused by conditions downstream from the container; and

controller means connected to receive the sensed carrier gas flow rate, the sensed temperature and the sensed pressure and to compare said sensed pressure with a reference pressure to provide a pressure differential indicative of a relatively small deviation from atmospheric pressure, said controller utilizing said pressure differential for reducing error in the mass flow rate of vapor which would otherwise be caused by said pressure deviation and producing a signal for controlling said carrier gas flow control valve means in a manner to produce a continuous, uniform mass flow of said vaporized liquid to said using system.

4,393,014

METHOD OF CASTING EXPLOSIVE CHARGE WITH HIGH SOLIDS CONTENT

George E. Ziegler, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 16, 1981, Ser. No. 302,946
Int. Cl.³ C06B *21/00*
U.S. Cl. 264—3 R **9 Claims**

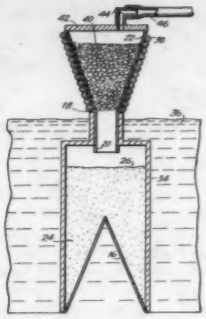
1. A method of casting an explosive charge of trinitrotoluene containing a high percentage of solid particles insoluble therein in a mold comprising:

adding said solid particles to said mold;

adding an appropriate quantity of said trinitrotoluene to said mold over said solid particles;

heating said mold with said solid particles and said trinitrotoluene contained therein whereby said trinitrotoluene is liquefied and diffuses into said solid particles;

drawing a vacuum in said mold whereby release of air from said explosive charge is encouraged; and



continuing the heating and drawing steps simultaneously for a long enough time to complete the diffusion and air release.

4,393,015

PROCESS OF PRODUCING URETHANE-MODIFIED POLYISOCYANURATE FOAMS

Hiroshi Kaneda, Higashimurayama; Katsuhiko Arai, Kodaira; Akira Suzuki, Hidaka, and Takashi Ohashi, Iruma, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,154
Claims priority, application Japan, Jan. 16, 1981, 56-3760
Int. Cl.³ C08G *18/14, 18/48, 18/18, 18/22*
U.S. Cl. 264—51 **20 Claims**

1. A process of producing urethane-modified polyisocyanurate foams by reacting an organic polyisocyanate with a polyol in the presence of a catalyst, a blowing agent and a surfactant to form a urethane-modified polyisocyanurate foam, wherein

(1) said polyol is at least one poly(oxyalkylene-oxyethylene)-polyether polyol having at least two functional groups and containing from about 10 to about 50% by weight of ethylene oxide;

(2) the molecular weight of said polyol is within a range of about 500 to about 1500 when said polyol is used singly, and the average molecular weight M of said polyols is within a range from about 500 to about 2500 and is represented by the formula

$$\overline{M} = \frac{M_1A_1 + M_2A_2 + \dots}{A_1 + A_2 + \dots}$$

wherein M_1, M_2, . . . are molecular weights of said polyols, and A_1, A_2, . . . are quantities thereof in parts by weight, when more than one said polyols are used in the form of a mixture;

(3) said polyol is used in an equivalent ratio to organic polyisocyanate of about 0.05:1 to about 0.5:1; and

(4) said catalyst is an alkali metal salt of a carboxylic acid or combination thereof with a tertiary amino compound.

4,393,016

PROCESS FOR PRODUCING PLATE-LIKE POLYSTYRENE RESIN FOAM

Hiroyuki Akiyama; Hideo Hatakeyama, both of Hiratsuka; Nobuyoshi Shimoyashiki, Isehara; Yoshiaki Momose, Hiratsuka, and Fusao Imai, Kamakura, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,172
Claims priority, application Japan, Sep. 1, 1980, 55/119856
Int. Cl.³ 264 *DIG. 5;* B29D *27/00*
U.S. Cl. 264—53 **4 Claims**

1. In a process for producing a plate-like polystyrene resin

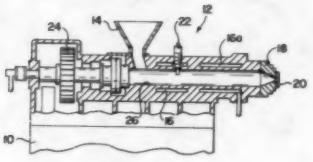
foam which comprises extruding a molten mixture consisting of a polystyrene resin and a volatile blowing agent by an extruder into a zone having a lower pressure than the inside of the extruder; the improvement wherein said volatile blowing agent is a mixture consisting of dichlorodifluoromethane, ethyl chloride and methyl chloride in which dichlorodifluoromethane accounts for 50 to 70% by weight of the mixture and the remainder consists of ethyl chloride and methyl chloride and the amount of ethyl chloride is at least 30% by weight based on the total amount of ethyl chloride and methyl chloride; and wherein said volatile blowing agent is present in said molten mixture in a proportion of 8 to 17 parts by weight per 100 parts by weight of the polystyrene resin component.

4,393,017

APPARATUS AND METHOD FOR MAKING FOAMED RESIN PRODUCTS

Hueng T. Kim, Avon Lake, and Sam D. Nehmey, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 18, 1981, Ser. No. 274,997
Int. Cl.³ B29D *27/00*; B29F *3/00*; B01F *15/02*
U.S. Cl. 264—53 **9 Claims**



1. Method for extruding a cellular resin product comprising charging resin into an extruder disposed horizontally, conveying the resin through the extruder by means of a feed screw disposed in the extruder, melting the resin as it is conveyed through the extruder, introducing a blowing agent into the resin through a conduit in a plurality of streams along a vertical plane through said resin and extruding the mixture of the resin and the blowing agent into a zone of lower pressure whereupon the blowing agent expands to form numerous cells in the resin.

4,393,018

METHOD FOR MAKING A CONCRETE BLOCK

William L. Harbaugh, Westmoreland County, and Raymond S. Smetana, Butler County, both of Pa., assignors to Burrell Construction & Supply Co., New Kensington, Pa.

Filed Sep. 8, 1981, Ser. No. 299,941
Int. Cl.³ F26B *3/00*
U.S. Cl. 264—82 **18 Claims**

1. A method for making metal fiber reinforced concrete block having a pair of opposite parallel surfaces in which the deviation from parallel throughout the spacing of the surfaces is not greater than plus or minus 0.032 inches and when installed in a crib configuration the crib develops 3,000 PSI compressive strength comprising:

a. providing a mold having two parallel, aligned, spaced apart inner face walls wherein the deviation from the parallel alignment of the inner face walls of the mold is not greater than plus or minus 0.032 inches;

b. providing a mix as follows:

(1) commencing with aggregates;

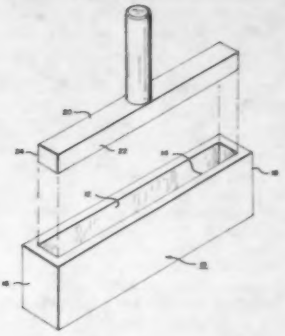
(2) adding metal fibers to the aggregates and mixing them with the aggregates; and

(3) then adding cement to the aggregates and metal fibers;

c. adding water to the mix and forming a mixture;

d. filling a mold with the mixture and compacting it in the mold to form the concrete block; and

e. advancing a stripper means through the mold wherein the stripper means frictionally engages the inner surfaces of



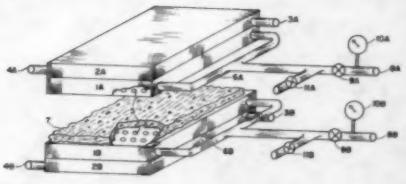
the two parallel walls and removes the concrete block from the mold.

4,393,019

METHOD OF PRESSING RECONSTITUTED LIGNOCELLULOSIC MATERIALS

Robert L. Geimer, Verona, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 326,086
Int. Cl.³ B29J *5/02*
U.S. Cl. 264—83 **8 Claims**



1. A method of producing a panel or the like from a mat formed of lignocellulosic material and a thermosetting resin binder in a press including a pair of heated platens wherein each platen has apertures opening to one surface thereof which is adjacent to the other platen, the improvement comprising the steps of:

a. compressing the mat between the apertured platens to a density of less than about 26 to 28 pounds per cubic foot;

b. introducing saturated steam into the mat through apertures of both apertured platens and simultaneously further compressing the mat between the apertured platens at a rate such that a mat centerline temperature of at least 212° F. is reached before the mat achieves a density of from 34 to 36 pounds per cubic foot and permitting the steam to escape through the edges of the mat;

c. continue compressing the mat between the apertured platens while maintaining the steam flow, until a desired final mat density is reached;

d. continue steaming the mat for a length of time sufficient for the mat to reach a maximum centerline temperature; and

e. maintaining the mat between the apertured platens for a length of time sufficient to cure the thermosetting resin binder.

4,393,020

METHOD FOR MANUFACTURING A FIBER-REINFORCED THERMOPLASTIC MOLDED ARTICLE

George S. Li, Macedonia; John F. Jones, Cuyahoga Falls, and William M. Giffen, Jr., Hudson, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 106,064, Dec. 20, 1979, abandoned.
This application Oct. 19, 1981, Ser. No. 313,015
Int. Cl.³ B29D 3/02
U.S. Cl. 264—108 14 Claims

1. The method for manufacturing a molded article from a fiber-reinforced thermoplastic resin comprising

(A) copolymerizing at least two vinyl monomers in the presence of fibers which are unidirectionally disposed to produce a resin-fiber composite composed of from about 60 to 95% by weight of fibers and correspondingly from about 5 to 40% by weight of resin, and

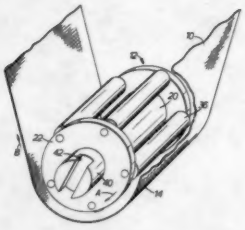
(B) compression molding the substantially oriented resin-fiber composite at a suitable temperature and pressure to form said molded article.

4,393,021

METHOD FOR THE MANUFACTURE OF GRANULAR GRIT FOR USE AS ABRASIVES

Gustav Eisenberg, Hanover, and Günter Bigorajski, Gehrden, both of Fed. Rep. of Germany, assignors to Vereinigte Schmirgel und Maschinen-Fabriken AG, Hannover-Hainholz, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,983
Int. Cl.³ B02C 4/14
U.S. Cl. 264—143 6 Claims



1. A method of producing granular grit particles each including several individual grits comprises the steps of

mixing the grits with a binding medium, and a filler to form a pasty mass,

pressing the mass through a mesh by relative rolling motion to form extruded lengths of the mass,

heating the extruded lengths to harden them, and

pressing the hardened lengths through a mesh by relative rolling action to form the said required granular grit particles.

4,393,022

ERASER AND PROCESS FOR ITS MANUFACTURE

Werner Handl, Altdorf, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nuremberg, Fed. Rep. of Germany

Division of Ser. No. 100,959, Dec. 6, 1979, abandoned, which is a division of Ser. No. 67,001, Aug. 16, 1979, Pat. No. 4,335,033.
This application Nov. 6, 1981, Ser. No. 318,923
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1978, 2837159
Int. Cl.³ B29C 17/14
U.S. Cl. 264—148 2 Claims

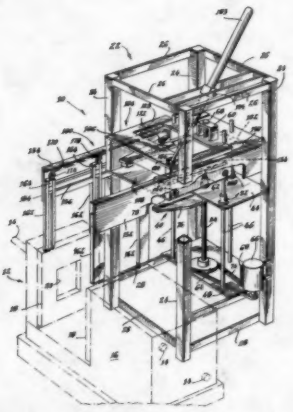
1. A method for the manufacture of an eraser based on polyvinyl chloride or polyvinyl chloride copolymer comprising preparing a polyvinyl chloride plastisol or polyvinyl chloride-copolymer plastisol in connection with unvulcanized synthetic or natural rubber, wherein first a pourable or flowable homogeneous substance is produced from mixing the polyvinyl chloride plastisol or polyvinyl chloride-copolymer plastisol and the rubber, and this substance is then fed into an extruder which has varying temperature ranges which increase from approximately 90° to 135° C. and from whose nozzle the cured or vulcanized eraser strand emerges and is cut into usable eraser size pieces after passing through a cooling zone.

4,393,023

METHOD FOR PREPARING A PARISON AND TRANSFERRING IT TO A MOLDING MACHINE

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Division of Ser. No. 115,944, Jan. 28, 1980, Pat. No. 4,340,345.
This application Aug. 31, 1981, Ser. No. 297,921
Int. Cl.³ B29C 17/07, 17/16
U.S. Cl. 264—150 10 Claims



1. A method of preparing a parison that is continuously extruded in an extrusion direction from an extrusion head and for transferring sections of said parison to a stationary molding machine mounted at a location laterally displaced from and below said extrusion head, said method comprising the steps of:

grasping and sealing said parison at one location on its length;

stretching said parison, while being extruded, in said extrusion direction by moving said one location away from said extrusion head at a controlled rate;

releasing said one location of said parison;

grasping and sealing said parison, after being stretched, at a second location on its length intermediate said one location and said extrusion head;

grasping and sealing said parison at a third location intermediate said second location and said one location to define a parison section between said one and third locations;

transferring said parison section transversely away from said extrusion head to sever said parison section from said parison between said second and said third locations; and

delivering said parison section, in a direction generally parallel to said extrusion direction, to said molding machine.

4,393,024

METHOD OF PRODUCING A RACKET FRAME

Chin-San You, No. 3, Lane 1019, Fong-Shih Rd., Fong Yuan City, Taiwan

Filed Dec. 18, 1981, Ser. No. 332,312
Int. Cl.³ B29C 17/08; B29D 3/02
U.S. Cl. 264—162 8 Claims

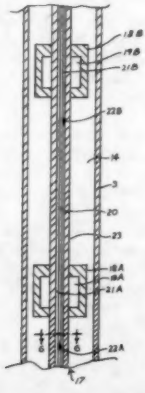
1. A method for making a racket frame comprising the steps of preparing two elongated strip members each including two racket handle portions and a racket head portion intermediate said racket handle portions and defining an elongated mold cavity section extending throughout its length, placing a thermosetting resin composition and fibres for reinforcing into the mold cavity sections, bringing said two strip members together in face-to-face relation with the mold cavity sections thereof in opposing relation to each other to form a structural member defining an elongated mold cavity containing said thermosetting resin composition and fibres, bending said strip members to form a shape of a racket frame, curing said thermosetting resin composition, and removing the strip members which comprise said structural member after curing.

4,393,025

METHOD OF AND APPARATUS FOR MEASURING THE POWER DISTRIBUTION IN NUCLEAR REACTOR CORES

Robert H. Leyse, 11114 Whisperwood La., Rockville, Md. 20852

Continuation of Ser. No. 913,977, Jun. 7, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 206,741
Int. Cl.³ G21C 17/00
U.S. Cl. 376—247 28 Claims



17. The method of monitoring elongated fuel elements, which emit gamma rays, of a nuclear reactor core, comprising:

(a) providing a flow path for the flow of a cooling fluid to be used for calibration purposes, and passing said cooling fluid along said flow path for calibration purposes,

(b) providing an elongated instrument element including electrical conducting material having first and second zones,

(c) locating said instrument in said flow path and exposing it to said fluid so that the temperature of the second zone depends on said temperature and rate of flow of said cooling fluid more than the temperature of the first zone depends on the temperature and rate of flow of said cooling fluid,

(d) passing an electrical current, for calibration purposes, through said electrical conducting material to supply heat to both of said zones with the first zone rising in temperature more than the second zone due to cooling effect of said cooling fluid on said second zone,

(e) measuring the temperature difference between said first and second zones to calibrate the instrument,

(f) placing the instrument parallel to and adjacent said elongated fuel elements,

(g) passing a cooling fluid past the instrument while it is adjacent said elongated fuel elements,

(h) the step of passing a cooling fluid past the instrument for calibration purposes as aforesaid involving fluid cooling conditions substantially identical to those characterizing the cooling fluid that is passed by the instrument while it is adjacent to the elongated fuel elements, and

(i) measuring the temperature difference between said two zones while the instrument is adjacent the elongated fuel elements with cooling fluid flowing past the same and without said electrical current flowing, whereby in view of the previous calibration of the instrument with said flow of current the output of the elongated fuel elements may be determined.

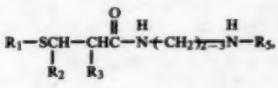
4,393,026

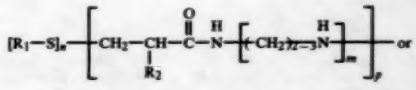
COMPOUNDS CONTAINING SULFUR AND AMINO GROUPS

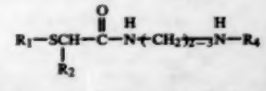
Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Nov. 10, 1981, Ser. No. 320,048
Int. Cl.³ C23F 11/04
U.S. Cl. 422—12 6 Claims

1. A process for inhibiting corrosion which is characterized by treating a metal with a composition containing







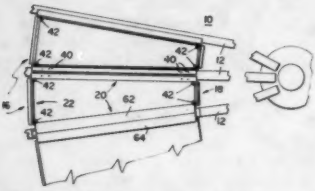
where R_1 is a hydrocarbon group, R_2, R_3 are H or alkyl, R_4, R_5 are H, alkyl, alkanol, or —alkylene N)$_n$H, n, m or p are one or more, or mixtures thereof.

4,393,027

PROCESS FOR ERECTING A ROTOR ASSEMBLY FOR A ROTARY EXTRACTOR AND APPARATUS THEREFOR

Donald A. Gessler, 5702 Crestmont Ave., Verona, Pa. 15147

Filed Sep. 8, 1981, Ser. No. 300,190
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—269 5 Claims



1. In a rotary solvent extractor including a vessel having a vertically-disposed rotor from which there is radially-disposed a plurality of cells arranged in a circumferential manner on a generally horizontal plane wherein each of said cells is disposed between radially-extending upper and lower support beams members mounted to said vertically-disposed rotor and wherein each cell is open at the top and provided with a hinged screen bottom door member, an improved cell assembly, which comprises:

side wall members having a cell surface and a side wall mounting surface, said side wall mounting surface having upper and lower prefabricated horizontally-disposed mounting elements, said mounting elements being positioned and affixed to said upper and lower support beam members, respectively, said cell surface of said side wall members being provided with prefabricated upper and lower inner and outer positioning bar elements;

an inner wall member having a cell surface and disposed between said side wall members with respect to said upper and lower inner positioning bar elements thereof;

an outer side wall member having a cell surface and disposed between said side wall members with respect to said upper and lower outer positioning bar elements; and

a gable cap means disposed over paired side wall members of adjacent cells to direct liquid flow into respective cells thereof.

4,393,028

METHOD OF REMOVING URANIUM FROM A SLURRY CONTAINING MOLYBDENUM

Thomas J. Crossley, Littleton, Colo., assignor to Wyoming Mineral Corporation, Lakewood, Colo.

Filed Jun. 12, 1981, Ser. No. 273,175
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—15 6 Claims

1. A method of separating uranium from molybdenum contaminated with said uranium comprising:

(1) preparing an aqueous slurry of said uranium contaminated molybdenum which comprises calcium, about 40 to about 60% of a water-insoluble molybdate, and about 0.1 to about 0.6% uranium calculated as U_3O_8;

(2) raising and maintaining the pH of said slurry about 10 with an alkali metal hydroxide;

(3) adding sufficient carbonate ion to said slurry to precipitate calcium carbonate and calcium uranate; and

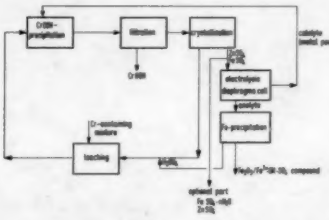
(4) separating said precipitated calcium carbonate and calcium uranate from the liquid portion of said slurry, which contains said molybdenum.

4,393,029

PROCESS FOR THE PRODUCTION OF AN IRON-FREE CHRONIUM (III) COMPOUND

Seppo O. Heimala; Stig E. Huitholm, both of Pori, and Frans H. Taovinen, Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jul. 22, 1981, Ser. No. 286,038
Claims priority, application Finland, Aug. 5, 1980, 802445
Int. Cl.³ C01G *37/00*
U.S. Cl. 423—55 4 Claims



1. A process for the leaching of a chromium raw material and the precipitation of a substantially iron-free chromium (III) compound at an elevated temperature and pressure from an acidic aqueous solution which contains iron and chromium, comprising leaching the chromium raw material and precipitating the chromium compound substantially in the same autoclave vessel, which vessel has leaching and precipitation zones separated from each other only by partition walls, whereby solution can pass from one zone to another zone by overflowing said walls; adding a finely divided additive selected from the group consisting of zinc, iron, chromium, manganese and a mixture of two or more members of the group to the precipitation zone in an amount sufficient to provide at least 2 g/l of bivalent chromium in the solution and to neutralize the acid present in the solution, the precipitation being carried out at a pH between 0.5 and 2.2 by addition of the additive and the temperature being from about 110° to 300° C., whereby the pressure is that which results from treating said solution at such temperature in an autoclave.

4,393,030

UPGRADING OF PHOSPHATE ORE

John B. Sardisco, and Dysart E. Holcomb, both of Shreveport, La., assignors to Pennzoil Company, Houston, Tex.

Filed Jan. 12, 1982, Ser. No. 338,998
Int. Cl.³ C01F *1/00*; C01B *15/16, 25/26*
U.S. Cl. 423—167 2 Claims

1. A method for upgrading unground low grade phosphate ore to remove slimes therefrom and provide a phosphate ore suitable for acidulation which comprises the steps of:

(a) contacting unground phosphate ore with phosphoric acid having a concentration of about 1 to 20 weight percent in an amount of about 2 to 10 parts of phosphoric acid per part of phosphate ore in a desliming unit to form a suspension containing the slimes and the phosphate ore;

(b) removing the suspension to a solids separator and separating phosphate ore slurry solids from the suspension containing the slimes;

(c) passing the phosphate ore to a grinding unit and grinding the phosphate ore solids in the presence of a weak phosphoric acid solution to provide a phosphate rock slurry suitable for acidulation;

(d) removing the suspension containing the slimes and flocculating the slime solids to cause precipitation of the slime solids and provide separation between the slime solids and the phosphoric acid process liquids;

(e) removing the resulting mixture to separation means and separating the slime solids from the process liquids;

(f) recycling at least a portion of the process liquids to the desliming unit and at least a portion to the grinding unit;
(g) removing the slime solids and reacting with weak phosphoric acid to acidulate finely divided phosphate rock contained therein and form a reaction mixture;
(h) removing the reaction mixture to a separation device and separating the slime solids from the process liquids;
(i) washing the slime solids with water, combining the wash water with the process liquids and recycling to be combined with the process liquids recovered from the separator in step (e); and
(j) recovering the slime solids which contain P_2O_5 values.

4,393,031

PROCESS FOR EFFICIENTLY REMOVING OXIDES OF NITROGEN FROM EXHAUST GAS

Werner Henke, P.O. Box 51932 Oil Center Station, Lafayette, La. 70501

Continuation of Ser. No. 13,892, Feb. 22, 1979, abandoned, and a continuation of Ser. No. 149,281, May 12, 1980, abandoned. This application Apr. 20, 1981, Ser. No. 255,824

Int. Cl.³ B01J *8/00*; C01B *21/00*

U.S. Cl. 423—239 **5 Claims**

1. A process for the removal of nitrogen oxides from a hot waste gas of a temperature of at least 420° F. and containing nitrogen oxides, comprising:

dividing the waste gas into a first, second and third portion;

passing said third portion through a cooling loop;

adding a methane containing gas mixture to said second portion so as to convert part of said second portion into at least the amount of ammonia required for stoichiometric reaction with the nitrogen oxides in the waste gas;

combining said first, third and ammonia containing second portion;

thoroughly mixing said combination until said combination is substantially thermally and compositionally homogeneous by passing said combination through a static mixing element; and

passing the thoroughly mixed combination over a catalyst that catalyzes the reduction of nitrogen oxides to gaseous nitrogen in the presence of ammonia.

4,393,032

PRODUCTION OF PHOSPHORIC ACID AND ADDITIONAL PRODUCTS FROM PHOSPHATE ORE

Erhart K. Drechsel, Montgomery, Tex.; Dysart E. Holcomb, and John B. Sardisco, both of Shreveport, La., assignors to Pennzoil Company, Houston, Tex.

Filed Jan. 12, 1982, Ser. No. 338,999

Int. Cl.³ C01B *25/16, 15/16, 25/26*

U.S. Cl. 423—320 **55 Claims**

1. A process for the production of phosphoric acid from deslimed phosphate ore which comprises the steps of:

(a) contacting said deslimed phosphate ore with a sufficient amount of a phosphoric acid solution in an acidulator to solubilize said phosphate ore and convert at least a portion of the calcium contained in the ore so as to form a solution of monocalcium phosphate in phosphoric acid containing sand solids and residual slimes;

(b) passing said solution through a separator to remove the sand solids from the solution of monocalcium phosphate in phosphoric acid and dividing the solution into two portions, said solution still containing residual slimes;

(c) contacting one of said portions which still contains residual slimes, with sufficient sulfuric acid in a first crystallizer to convert all the incoming calcium equivalent to the calcium in the ore to calcium sulfate, and wherein the sulfuric acid is added to the said portion at a sufficient rate to maintain a total SO_3 content in the first crystallizer solution of about 1.5 to 4.0 wt.% and form a mixture containing phosphoric acid and calcium sulfate;

(d) reacting the mixture from the first crystallizer with the remaining portion of the said solution which still contains residual slimes, in a second crystallizer, there being sufficient calcium in the said remaining portion to neutralize the SO_3 content contained in the mixture from the first crystallizer and form a slurry containing calcium sulfate and phosphoric acid;

(e) removing the resulting slurry, passing to a separator and separating the calcium sulfate solids from the phosphoric acid solution; and

(g) recovering the phosphoric acid.

4,393,033

PROCESS FOR THE PREPARATION OF AMMONIUM SULFAMATE

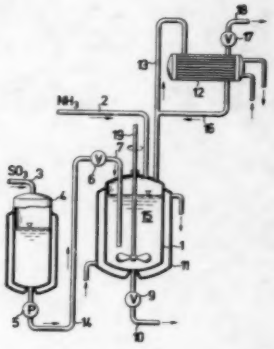
Adolf Metzger, Wiesbaden; Rolf Konrad, Steinbach, and Reinhold Gräser, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,236

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048057

Int. Cl.³ C01B *21/093, 21/086*

U.S. Cl. 423—388 **8 Claims**



1. A process for the continuous preparation of ammonium sulfamate, starting from ammonia and sulfur trioxide, by introducing liquid sulfur trioxide and liquid ammonia in a molar ratio NH_3/SO_3 greater than 2.0:1 into a pressure reactor containing the reaction product in a molten state, excess ammonia being removed continuously from the reactor and the liquid sulfur trioxide being introduced into the melt, which comprises introducing the liquid ammonia onto the surface of the melt.

4,393,034

ENERGY EFFICIENT PROCESS FOR THE PRODUCTION OF CARBON BLACK

Norman L. Smith, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 22, 1980, Ser. No. 199,173

Int. Cl.³ C01B *31/02*; C09C *1/48*

U.S. Cl. 423—450 **2 Claims**

1. A method of operating an elongated, generally cylindrical reactor having an upstream and downstream end for the production of carbon black by the furnace process wherein the combustible gases generated a pyrolytically dissociating a carbon black producing feedstock are cyclically utilized as the fuel for effecting the dissociation reaction, which comprises:

introducing a hydrocarbon fuel together with a 25–75% stoichiometrical excess of oxidant gas containing at least 70 volumetric percent oxygen into the upstream end of said reactor and substantially completely burning the fuel to provide a turbulent mixture of combustion gases;

injecting a normally liquid aromatic-rich hydrocarbon feed-

stock into said turbulent mixture of combustion gases and burning said feedstock to the extent provided by the presence of free oxygen in the combustion gases while essentially simultaneously effecting the pyrolytical dissociation of the unoxidized portion of the feedstock to generate a carbon black aerosol;

quenching the pyrolysis reaction and discharging the aerosol from the downstream end of the reactor whence the carbon black is recovered by filtration;

continuously maintaining the production of carbon black in the manner above defined until steady state conditions are attained; and

thereupon recycling a portion of the filtered reactor gaseous effluent substantially free of condensible gases to the reactor in lieu of the hydrocarbon fuel utilized in attaining steady state conditions, said effluent being introduced at a rate adapted to provide a combustion temperature of about that associated with the burning of the initially introduced hydrocarbon fuel while continuing to introduce a 25–75% stoichiometrical excess of the oxidant gas for burning said filtered gaseous effluent.

4,393,035

CHLORINE DIOXIDE PRODUCTION USING MIXED HYDROCHLORIC AND SULFURIC ACID FEED

Maurice C. J. Fredette, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Nov. 2, 1981, Ser. No. 317,518

Claims priority, application United Kingdom, Nov. 17, 1980, 8036835

Int. Cl.³ C01B *11/02, 7/01, 17/74*

U.S. Cl. 423—478 **22 Claims**

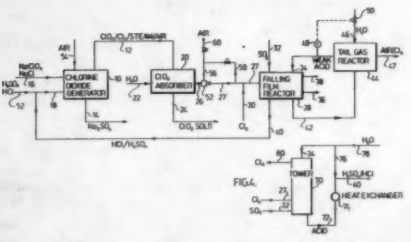


FIG.4.

1. In a process for the production of chlorine dioxide wherein chlorine dioxide and chlorine are formed in gaseous admixture with steam from an aqueous acid reaction medium to which are fed sodium chlorate, hydrochloric acid and sulphuric acid, and optionally sodium chloride, which is maintained at its boiling point under subatmospheric pressure and from which sodium sulphate precipitates as a by-product, chlorine dioxide solution is formed from the gaseous admixture, hydrochloric acid and sulphuric acid are formed by reaction of sulphur dioxide, chlorine and water in a reaction zone, and the hydrochloric acid and sulphuric acid are forwarded to the reaction medium, the improvement which comprises cooling said reaction zone sufficiently to maintain the reactants in said reaction zone at a temperature below the boiling point of water during said reaction, said cooling being achieved, at least in part, by effecting said reaction of sulphur dioxide, chlorine and water in a cooled falling film absorber in which the water forms the falling film and having integral cooling passages through which a cool heat exchange medium flows out of fluid flow communication with but in heat exchange with the falling film.

16. A method for the production of hydrochloric acid and sulphuric acid, which comprises:

separately feeding chlorine, sulphur dioxide and water to a reaction zone,

intimately contacting said chlorine, sulphur dioxide and water to cause the same to react in the presence of excess water in accordance with the equation:

$$SO_2+Cl_2+2H_2O \rightarrow 2HCl+H_2SO_4$$

to form an aqueous mixture of hydrochloric acid and sulphuric acid, and

cooling said reaction zone sufficiently to maintain the reactants in said reaction zone at a temperature below the boiling point of water during said reaction,

said reaction zone being defined by a packed tower, to which said chlorine and sulphur dioxide are directly fed and to which said water is fed in admixture with cooled recycled mixed acid, a hot mixed acid stream of hydrochloric acid and sulphuric acid is removed from the packed tower and passed through a heat exchanger to which a cool heat exchange medium also is passed in order to cool the hot mixed acid, a proportion of the cooled mixed acid is recovered as a product stream, and the remainder of the cooled mixed acid is recycled to the reaction zone in said admixture with said water.

4,393,036

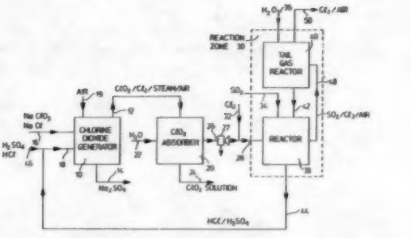
PRODUCTION OF MIXED SULFURIC AND HYDROCHLORIC ACID FEED AND CHLORINE DIOXIDE GENERATION THEREWITH

Maurice C. J. Fredette, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Nov. 10, 1981, Ser. No. 319,971

Int. Cl.³ C01B *7/01, 11/02, 17/74*

U.S. Cl. 423—478 **9 Claims**



1. A process for the production of chlorine dioxide, which comprises:

reacting sodium chlorate with chloride ions and hydrogen ions in an aqueous acid reaction medium having a total acid normality of about 2 to about 4.8 normal to form chlorine dioxide and chlorine, said chloride ions being provided by hydrochloric acid alone or by hydrochloric acid and sodium chloride and said hydrogen ions being provided by sulphuric acid and said hydrochloric acid,

maintaining said reaction medium at its boiling point at a temperature below that above which substantial decomposition of chlorine dioxide occurs while applying a subatmospheric pressure to a first reaction zone containing said reaction medium to form steam in a volume ratio of steam to chlorine dioxide of about 4:1 to about 10:1,

depositing anhydrous neutral sodium sulphate from the reaction medium and removing the same from said first reaction zone,

removing a gaseous mixture of chlorine dioxide, chlorine and steam from said first reaction zone and forming an aqueous solution of said chlorine dioxide therefrom, said aqueous solution of chlorine dioxide also containing part of said chlorine,

forwarding the chlorine not dissolved in said chlorine dioxide solution at substantially atmospheric pressure and in admixture with air to a second reaction zone to which sulphur dioxide and water, along with additional chlorine, if neces-

sary, are fed for reaction between said chlorine, sulphur dioxide and water in the presence of excess chlorine to form an aqueous mixture of hydrochloric acid and sulphuric acid,

venting unreacted chlorine and said air from said second reaction zone, controlling the partial pressure of said unreacted chlorine vented from said second reaction zone to a value in the range of about 150 to about 550 mm Hg to provide sufficient of said excess chlorine in said second reaction zone to form said aqueous mixture of hydrochloric acid and sulphuric acid having a total acid normality of about 6 to about 14 normal and from which dissolved sulphur dioxide is absent, and

forwarding said aqueous mixture of hydrochloric acid and sulphuric acid to said reaction medium and forwarding such additional quantities of hydrogen ions, chloride ions and sulphate ions to said reaction medium as are required by the stoichiometry of the reactions occurring in the reaction medium.

6. A process for the production of hydrochloric acid and sulphuric acid, which comprises:

separately feeding chlorine, sulphur dioxide and water to a reaction zone;

intimately contacting said chlorine, sulphur dioxide and water in the presence of air and excess chlorine and water and reacting the same in accordance with the equation:

$$SO_2+Cl_2+2H_2O \rightarrow 2HCl+H_2SO_4$$

to form an aqueous mixture of hydrochloric acid and sulphuric acid,

venting unreacted chlorine and said air from said reaction zone, controlling the partial pressure of said unreacted chlorine vented from said reaction zone to a value in the range of about 150 to about 550 mm Hg to provide sufficient of said excess chlorine in said reaction zone to form said aqueous mixture of hydrochloric acid and sulphuric acid having a total acid normality of about 6 to about 14 normal and from which dissolved sulphur dioxide is absent, and

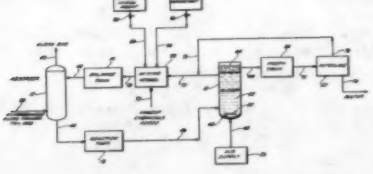
removing the sulphur dioxide-free aqueous mixture of hydrochloric acid and sulphuric acid from the reaction zone.

4,393,037

METHOD FOR RECONDITIONING BACTERIA-CONTAMINATED HYDROGEN SULFIDE REMOVING SYSTEMS

Dennis D. Delaney, Placentia, and Donald M. Fenton, Anaheim, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Dec. 16, 1981, Ser. No. 331,070
Int. Cl.³ B01D *53/34*; C01B *17/04, 17/14*
U.S. Cl. 423—573 R **19 Claims**



1. A method for reconditioning a hydrogen sulfide gas removal system employing a washing solution in which hydrogen sulfide is reacted to form elemental sulfur and which has means for agglomerating said particles to enable sulfur removal from said solution and means for regenerating said solution for reuse, after said system and said solution have become contaminated with living, sulfur-feeding bacteria to an extent that normal operations of said sulfur removal means and of said solution regenerating means are substantially impaired, said reconditioning method comprising the steps of:

(a) contacting said sulfur-feeding bacteria in said solution with a bactericidal agent selected from the group consisting of water-soluble phenols, the water-soluble salts and hydrates of phenols and the mixtures thereof to destroy substantially all of said sulfur-feeding bacteria; and

(b) contacting said sulfur particles in said solution with a surfactant to remove a sufficient number of destroyed sulfur-feeding bacteria from surfaces of said sulfur particles to enable said particles to agglomerate in said sulfur removal means.

4,393,038

HYDROGEN PEROXIDE PRODUCTION

Hsiang-ning Sun, Media; John J. Leonard, Springfield, and Harold Shalit, Bala Cynwyd, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 16, 1981, Ser. No. 312,060
Int. Cl.³ C01B *15/02*
U.S. Cl. 423—584 **3 Claims**

1. A method of preparing aqueous solution of hydrogen peroxide which method consists of:

providing a slightly acidic aqueous solution containing ions tending to stabilize hydrogen peroxide and substantially free from ions catalyzing the decomposition of hydrogen peroxide;

dissolving oxygen in said aqueous solution; positioning a first surface of a predominantly palladium membrane metallic structure in contact with said aqueous solution containing dissolved oxygen;

controlling the pressure of a hydrogen stream so that hydrogen is supplied to the surface opposite said first surface of said metallic structure at a rate at least equal to the diffusion rate of hydrogen through said membrane;

controlling the temperature of said aqueous solution and said metallic structure to be within the range from 10°–150° C., whereby the hydrogen diffusing to said first surface surface of said membrane reacts with dissolved oxygen to form a reaction mixture consisting of hydrogen peroxide and water plus said aqueous solution;

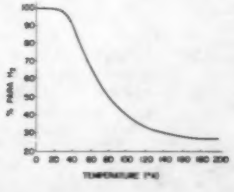
directing a stream of said reaction mixture to a recovery zone appropriate for the recovery of the thus produced hydrogen peroxide.

4,393,039

COOLING BY CONVERSION OF PARA TO ORTHO-HYDROGEN

Allan Sherman, Lanham, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 10, 1981, Ser. No. 301,075
Int. Cl.³ C01B *1/00*
U.S. Cl. 423—648 R **9 Claims**



1. A hydrogen vapor cooling process, comprising the steps of:

generating a vapor having a high para-hydrogen composition;

transferring heat from a heat source to said vapor to cool said heat source; accelerating the conversion of said vapor

from a high para-hydrogen composition to a mixture of para-hydrogen and ortho-hydrogen by passing said vapor through a layer of a catalyst selected from the group consisting of metal hydride gels of iron, nickel or copper; transferring heat from a second heat source to said vapor to cool said heat source.

4,393,040

IN-VITRO DIAGNOSTIC METHOD FOR DETECTION OF ACETYLSALICYLIC ACID INGESTION

Alberto F. Lopapa, and Theodore D. Hall, both of Los Angeles, Calif., assignors to Lopapa Institute, Inc., Los Angeles, Calif.

Filed Mar. 24, 1981, Ser. No. 246,993
Int. Cl.³ G01N *33/56, 33/58, 33/60*
U.S. Cl. 424—1 **8 Claims**

1. An in-vitro diagnostic method for detecting acetylsalicylic acid ingestion by a patient by utilizing radioimmunoassay procedure, the method comprising the steps of:

(a) derivatizing acetylsalicylic acid with a protein moiety, said derivatizing procedure being effected in a molar ratio of about 1 mole of protein to at least 30 moles of acetylsalicylic acid;

(b) coupling the acetylsalicylic acid derivatized protein obtained from step (a) with a water insoluble solid matrix, said coupling being effected with a coupling agent having a reactive group selected from the group consisting of amino groups, hydroxyl groups, nitro groups, halo groups, amido groups, carboxylic groups and mixtures thereof;

(c) obtaining a sample of serum from a patient suspected of having ingested acetylsalicylic acid;

(d) lyophilizing said serum including any antibodies specific to acetylsalicylic acid to concentrate said serum to a solid phase;

(e) diluting said lyophilized serum to from about 100 to about 1,000 times the serum's original concentration;

(f) incubating said solid matrix coupled with the acetylsalicylic acid derivatized protein with said concentrated serum for a sufficient period of time to allow any antibodies specific to acetylsalicylic acid to attach to said solid matrix coupled with the acetylsalicylic acid derivatized protein, said incubation occurring for a period of at least 24 hours at a temperature of from about 4° C. to about 42° C.;

(g) thereafter, incubating said solid matrix bound with specific antibodies present with radioactively labelled antibodies specific to acetylsalicylic acid derivatized protein obtained from a test animal for a sufficient period of time to allow binding between said labelled antibodies and said solid matrix obtained from step (f);

(h) separating the solid matrix from the liquid phase;

(i) and measuring radiation emitted from at least one of the separated phases.

4,393,041

FIBRIN BINDER/CARRIER FOR ACTIVE BIOCHEMICAL AGENTS

Ross G. Brown; David R. Bright, and Robert D. Williams, all of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind. and International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Apr. 25, 1980, Ser. No. 143,709
Int. Cl.³ A61K *9/24*
U.S. Cl. 424—19 **7 Claims**

1. In a method of administering an active biochemical agent to a living animal over a controlled period of time by subcutaneously implanting in said animal a pellet comprising said active biochemical agent and a biocompatible excipient comprising bovine fibrin, said active biochemical agent being selected from the group consisting of hormones, steroids, estradiol compounds and anabolic agents for promoting growth and feed efficiency in said living animal.

4,393,042

ULTRA HIGH-FOAM DENTIFRICE

Orlando A. Battista, 3725 Fox Hollow Rd., Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 176,013, Aug. 7, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,394
Int. Cl.³ A61K *9/16*
U.S. Cl. 424—49 **8 Claims**

1. In the art of cleaning teeth with a regular or electric toothbrush the improvement which consists essentially of the step of using the toothbrush with a heavy-bodied astringent dentifrice resembling, in texture, whipped cream, which sweeps up and physically holds, or which entraps mouth bacteria, food particles and gum line debris which can be subsequently flushed out of the mouth with water, the dentifrice comprising essentially water and a non-toxic, alkaline soap, the soap constituting at least about 25 percent up to about 50 percent of the weight of the dentifrice and being further characterized in producing a high viscosity, stable foam having a pH of at least about 7.5, the foam consisting of a multiplicity of firm, discrete bubbles which entrap and physically hold and, upon flushing with water, carry away mouth bacteria, food particles and gum line debris on and adjacent the surfaces of and crevices between the teeth.

4,393,043

SOLUTIONS CONTAINING AT LEAST ONE ESSENTIAL FATTY ACID AND VEGETABLE OIL, AND COSMETIC COMPOSITIONS CONTAINING THESE SOLUTIONS

Constantin Koulbanis; Arlette Zabotto, both of Paris; Jacqueline Griat, Ablon, and Jean Charrier, Chevilly-Larue, all of France, assignors to Societe Anonyme dite L'Oreal, Paris, France

Filed Jan. 19, 1981, Ser. No. 226,093
Claims priority, application France, Jan. 25, 1980, 80 01681
Int. Cl.³ A61K *7/42*
U.S. Cl. 424—59 **4 Claims**

1. A cosmetic composition which comprises an oxidation-stable solution of 0.5 to 20% of an essential fatty acid or a mixture of essential fatty acids in a vegetable oil, said essential fatty acid or acids being selected from the group consisting of linoleic acid or an isomer thereof, a conjugated linoleic acid or an isomer thereof, α-linolenic acid or an isomer thereof, γ-linolenic acid or an isomer thereof, and arachidonic acid or an isomer thereof, and said vegetable oil being jojoba oil in an amount of about 80% to about 99.5% by weight of said solution.

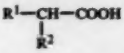
4,393,044

STEROID ESTER, AND COSMETICS AND OINTMENTS CONTAINING THE SAME

Atsunobu Takada, Yokohama, and Yuzo Higaki, Machida, both of Japan, assignors to The Nisshin Oil Mills Limited, Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,847
Claims priority, application Japan, May 29, 1980, 55/71708; Jun. 10, 1980, 55-78156
Int. Cl.³ A61K *7/42, 7/02, 7/025*
U.S. Cl. 424—59 **51 Claims**

1. A cosmetic comprising a cosmetic ingredient and a steroid ester obtained by reacting at least one steroid component which is a trimethylsteroid or a mixture comprising said trimethylsteroid, and wherein the trimethylsteroid is dihydrolanosterol, lanosterol, dihydroagnosterol, agnosterol, cycloartanol, cycloartenol, 2,4-methylenecycloartanol, cyclolaudenol, cyclobranol, isocholesterol or a mixture thereof, with at least one carboxylic acid-based component selected from the group consisting of free α-branched carboxylic acids having a general formula



(where R^1 is an alkyl group having at least two carbon atoms, and R^2 is an alkyl group having at least four carbon atoms) and reactive derivatives of said α-branched carboxylic acid which are acid halides or anhydrides, said cosmetic is a creamy cosmetic for the skin including a cold cream, a nutritive cream, and a cleansing cream, a stick cosmetic for the skin including a lipstick and an eyeshadow, a pasty cosmetic for the hair including a pomade, or a liquefied or emulsified cosmetic for the hair including a hair dresser and a hair rinse.

4,393,045

COSMETIC COMPOSITION

Esther G. Henderson, and Inger V. Mallet, both of 2521 Main St., Baton Rouge, La. 70802

Filed Oct. 29, 1981, Ser. No. 316,111

Int. Cl.³ A01N *63/02*; A61K *35/12*

U.S. Cl. 424—95 **6 Claims**

1. A curative, cosmetic composition formed by intimately admixing the extrudate of a citric acid containing fruit with the inner lining of a mollusk shell, said composition having healing properties on a variety of skin afflictions when applied topically to humans.

4,393,046

COMBINATION OF THIOPEPTIN AND OTHER RELATED SULFUR-CONTAINING CYCLIC POLYPEPTIDE ANTIBIOTICS WITH RUMEN-ACTIVE DIIMIDES TO IMPROVE RUMINANT FEED EFFICIENCY

Francis P. Baylis, Greenbrook, N.J., and Gary E. Smith, Vale, Oreg., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 30, 1981, Ser. No. 229,806

Int. Cl.³ A23K *1/16, 1/17*; A61K *31/40, 47/00*

U.S. Cl. 424—117 **4 Claims**

1. An orally administered synergistic combination useful for increasing the feed efficiency of ruminants which comprises a finished feed product and a synergistic combination of from 0.0001% to 0.01% by weight of thiopeptin with from 0.0001% to 0.02% by weight of a pyromellitic diimide compound selected from the group consisting of

(a) pyromellitic diimide;

(b) (N-(2-hydroxyethyl)pyromellitic diimide; and

(c) N,N'-bis-(2-hydroxyethyl)pyromellitic diimide.

4,393,047

ANTIBIOTIC CYTOPHAGIN AND A PROCESS FOR PRODUCING THE SAME

Hamao Umezawa; Tomio Takeuchi, both of Tokyo, and Hiroshi Nakano, Machida, all of Japan, assignors to Microbiochemical Research Foundation, Tokyo, Japan

Continuation-in-part of Ser. No. 131,344, Mar. 18, 1980, abandoned. This application Jul. 1, 1981, Ser. No. 279,489

Int. Cl.³ A61K *35/00*; C12P *1/04, 21/00*; C12R *1/01*

U.S. Cl. 424—118 **4 Claims**

1. A substance having antibiotic activity, designated as cytophagin, which is stable in the form of colorless powder and which possesses the following physico-chemical properties:

(1) Elemental analysis: H: 6.94%, C: 47.22%, N: 13.21%

(2) Molecular weight: 1,000 to 1,500 [determined by gel filtration]

(3) Melting point: Browning at about 210° C. and decomposing with foaming at about 220° C.

(4) Specific rotation: $[\alpha]_D^{25} = +5°$ (c=1 in DMSO)

(5) Ultraviolet absorption spectrum: As shown in FIG. 1 (c=25 μg/ml in methanol)

(6) Infrared absorption spectrum: As shown in FIG. 2 (by KBr tablet method)

(7) Solubility invarious solvents: Readily soluble in acetic acid and dimethylsulfoxide, substantially soluble in methanol and ethanol, and hardly soluble in water, chlorofoem, acetone, ethyl acetate and ethyl ether

(8) Color reaction: Positive in ninhydrin reaction, Ehrlich reaction and isatine reaction, and negative in Sakaguchi reaction, Pauly reaction and anisidine reaction.

(9) Nature: Neutral

(10) Color and appearance: Colorless powder

(11) Amino acids constituents: Lysine, aspartic acid, threonine, serine, proline, glycine, leucine, trypsine and other 3 amino acids (each one molecule thereof)

(12) Rf value: 0.23 [by silica gel thin layer chromatography using as silica gel plate Art. 5721 (Merck AG., Germany) and a solvent system of n-butanol/acetic acid/water (12:3:5)].

3. A process for producing the substance claimed in claim 1, which process comprises the steps of culturing a microorganism selected from Cytophaga BMF 694-N3 (FERM P-4846; NRRL B-12109) and mutants thereof capable of producing the said substance in a culture medium under aerobic conditions to accumulate the said substance in the cultured broths and recovering the said substance therefrom.

4,393,048

PROTECTIVE GEL COMPOSITION FOR WOUNDS

Arthur D. Mason, Jr.; Avery A. Johnson, Jr., both of San Antonio; Harrel L. Walker, Sutherland Springs; Eleanor G. Bowler, San Antonio, all of Tex., and Charles R. Ritchey, Stillwater, Okla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 121,868, Feb. 15, 1980, abandoned. This application Oct. 30, 1981, Ser. No. 316,574

Int. Cl.³ A61K *33/38*

U.S. Cl. 424—132 **13 Claims**

1. A gel composition, having use as a wound dressing, comprising a water-soluble hydrogel consisting essentially of about 0.5 to 3% by weight of alkali metal alginate, about 8 to 12% by weight glycerine and about 82 to 90% by weight water wherein said hydrogel has a pH in the range of 6.8 to 7.2 and which upon drying forms a flexible, stretchable, transparent water-soluble protective film, nontoxic and adherent to a wound surface to which said gel composition is applied for protection.

4,393,049

TREATMENT FOR OBESITY

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Continuation-in-part of Ser. No. 89,293, Oct. 30, 1979, Pat. No. 4,302,477, which is a continuation-in-part of Ser. No. 4,924, Jan. 19, 1979, Pat. No. 4,373,763. This application Jun. 10, 1981, Ser. No. 272,082

Claims priority, application United Kingdom, Jan. 23, 1978, 2642/78; Feb. 7, 1978, 4921/78; Apr. 19, 1978, 15481/78; Aug. 17, 1978, 33682/78; Oct. 24, 1978, 41761/78

Int. Cl.³ A61K *33/30, 31/315, 31/20, 31/33*

U.S. Cl. 424—145 **14 Claims**

1. A method of treating obesity comprising administering to a person suffering therefrom an effective amount of γ-linolenic acid or physiologically functional derivative thereof and/or dihomo-γ-linolenic acid or physiologically functional derivative thereof.

4,393,050

ANALOGS OF EXTENDED N-TERMINAL SOMATOSTATIN

Wylie W. Vale, Jr.; Jean E. F. Rivier, both of La Jolla, and Marvin R. Brown, Del Mar, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 29, 1981, Ser. No. 258,878

Int. Cl.³ A61K *37/00*; **C07C** *103/52*

U.S. Cl. 424—177 **16 Claims**

1. A pharmaceutical composition for decreasing gastric acid secretion comprising an effective amount of an analog of SS-28 having the formula:

H-Ser-Ala-Asn-Ser-Asn-Pro-Ala-Leu-Ala-Pro-Arg-Glu-Arg-

Lys-Ala-Gly-Cys-R_{18}-R_{19}-Phe-Phe-D-Trp-Lys-Thr-R_{25}-

R_{26}-R_{27}-R_{28}-OH

wherein R_{18} is Lys or des R_{18}, R_{19} is Asn or des R_{19}, R_{25} is Phe or Tyr, R_{26} is Thr or des R_{26}, R_{27} is Ser or D—Ser and R_{28} is D—Cys or Cys, or a nontoxic addition salt thereof, and a pharmaceutically acceptable liquid or solid carrier therefor.

4,393,051

1-N(AMINOPOLYHYDROXYALKYL)AMINOGLYCOSIDE ANTIBIOTICS AND METHOD OF USE

Peter Stadler, Haan; Karl G. Metzger, Wuppertal; Eckart Voss, Cologne; Uwe Petersen, Leverkusen, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

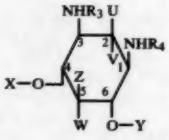
Filed Jun. 2, 1980, Ser. No. 155,896

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1979, 2924659

Int. Cl.³ A61K *31/71*; **C07H** *15/22*

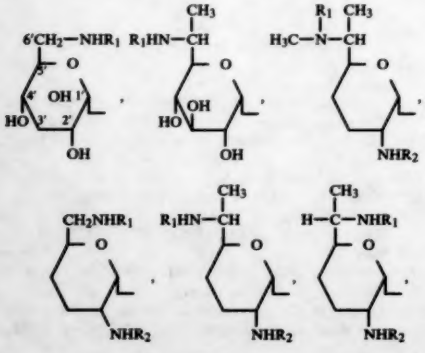
U.S. Cl. 424—180 **12 Claims**

1. A compound which is a pseudotrisaccharide of the formula



or a pharmaceutically acceptable acid addition salt thereof, in which

X denotes a radical of the formulae



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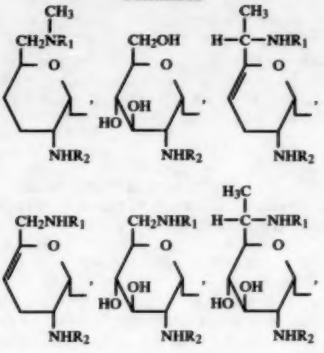
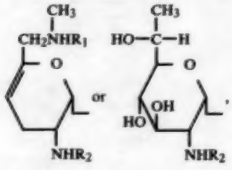
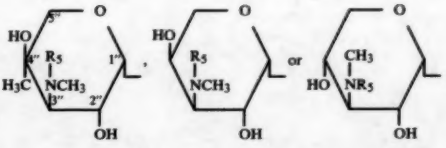




Y denotes a radical of the formula



U and V both denote hydrogen atoms, or one denotes a hydrogen atom and one denotes a hydroxyl group and

W and Z both denote hydrogen atoms, or one denotes a hydrogen atom and one denotes a hydroxyl group, or

Z denotes NHR_6 and

W denotes a hydrogen atom, and

R_1, R_2, R_3, R_4, R_5 and R_6 independently of one another denote a hydrogen atom or an amino-polyhydroxyalkyl radical derived from an amino sugar which is optionally N-protected and optionally carries C_1–C_4-alkyl, carboxylic acid acyl or C_1–C_6-alkylidene radicals on one or more OH-groups, at least one of the radicals R_1 to R_5 being other than hydrogen.

10. A method of combating bacterial diseases in warm-blooded animals which comprises administering to the animals an antibacterially effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,393,052

ANTITUMOR ANTHRACYCLINE GLYCOSIDES, THEIR PREPARATION, INTERMEDIATES THEREFOR, AND COMPOSITIONS AND USE THEREOF

Alberto Bargiotti, Milan; Giuseppe Cassinelli, Voghera; Sergio Penco, Milan; Federico Arcamone, Nerviano, and Annamaria Casazza, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

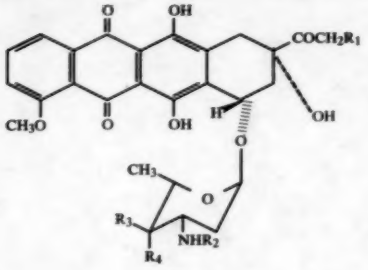
Filed Oct. 29, 1981, Ser. No. 316,058

Claims priority, application United Kingdom, Nov. 1, 1980, 8035195

Int. Cl.³ A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 10 Claims

1. An anthracycline glycoside of the formula I:



(I)

wherein R_1 is hydrogen or hydroxy; R_2 is hydrogen or trifluoroacetyl; R_3 is methyl, hydroxymethyl, aminomethyl or trifluoroacetylaminomethyl; and R_4 is hydrogen or hydroxy, with the proviso that when R_4 is hydroxy, R_3 is aminomethyl; or R_3 and R_4 together form methylene, and pharmaceutically acceptable acid addition salts thereof.

10. A method of inhibiting the growth of P388 ascitic leukemia comprising administering to a mammal afflicted therewith, a therapeutically effective amount of a compound according to claim 1.

4,393,053

THIOLIC DERIVATIVES OR ERYTHROMYCIN HAVING THERAPEUTIC ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jacques Gonella, Zollikon, Switzerland, assignor to Refarmed S.A., Zollikon, Switzerland

Filed Feb. 2, 1982, Ser. No. 344,961

Claims priority, application France, Feb. 2, 1981, 82 00821

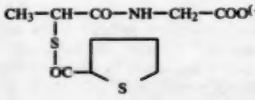
Int. Cl.³ A61K *31/71*; C07H *17/08*

U.S. Cl. 424—180 7 Claims

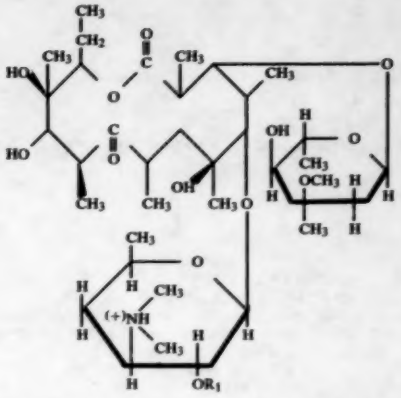
1. Thiolic derivatives of erythromycin and of the propionic ester of erythromycin having the formula

R—X (I)

wherein R is the radical of thenoyl alpha-mercaptopropionylglycine



and X is the radical of erythromycin or of 3'-propionic ester of erythromycin having the formula



in which R_1 is H or $CH_3—CH_2—CO$.

4. A pharmaceutical composition comprising as the active ingredient a thiolic derivative according to claim 1 in an amount effective to have an erythromycin activity together with a pharmaceutically acceptable carrier.

4,393,054

METHOD OF TREATING CARDIAC ARRHYTHMIA

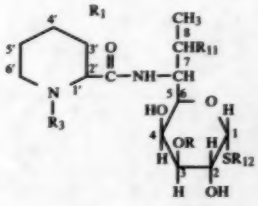
Harry R. Allen, Texas Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 19, 1982, Ser. No. 379,528

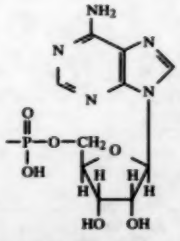
Int. Cl.³ A61K *31/71*; C07H *15/16*

U.S. Cl. 424—180 3 Claims

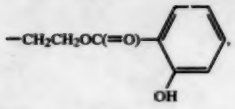
1. The method for the treatment of cardiac arrhythmia in a patient which comprises administering a pharmaceutical carrier and a cardiac arrhythmia inhibiting quantity of a compound of the formula



wherein R is



R_1 is H, C_1–C_8-alkyl; R_{11} is OH, OCH_3, halogen (Cl, Br, I), $—SCH_2CH_2OH$, $—SCH_2CH_2CH_2OH$, SCH_3; R_{12} is CH_3, CH_2CH_3, $—CH_2CH_2OH$,



or the pharmaceutically acceptable acid addition salts thereof.

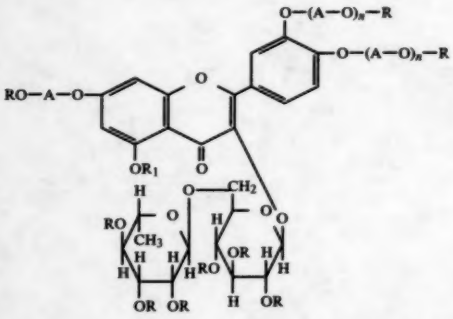
4,393,055

HYDROXYALKYL ETHER DERIVATIVES OF RUTIN POLY(H-)SULFATE AND METHOD OF USE

Vijay G. Nair, New York, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 3, 1982, Ser. No. 373,958
Int. Cl.³ A61K *31/70*; C07H *11/00*
U.S. Cl. 424—180 **35 Claims**

11. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein A is C_1–C_5 alkyldiyl; n is an integer zero or one; R is SO_3B; R_1 is hydrogen or SO_3B; and B is a pharmaceutically acceptable salt cation, wherein the salt forming moiety is selected from the group alkali metal, alkaline earth metal, ammonia and substituted ammonia selected from the group C_1–C_6 trialkylamine, piperidine, pyrazine, C_2–C_6 alkanolamine and C_3–C_6 cycloalkylamine.

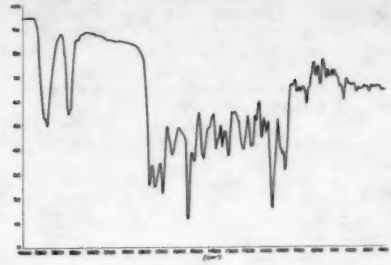
4,393,056

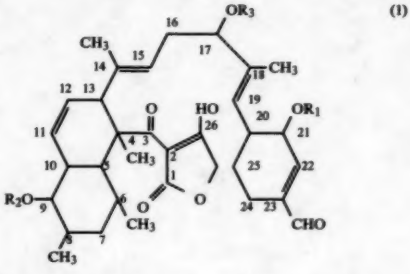
ANTIBIOTICS TETRONOLIDE COMPOUNDS AND PROCESS FOR PRODUCTION THEREOF

Fusao Tomita; Tatsuya Tamaoki; Kunikatsu Shirahata, all of Machida; Masaji Kasai, Fujisawa; Noriaki Hirayama, Machida; Makoto Morimoto, Numazu, all of Japan, and Masanori Fukui, Chicago, Ill., assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1981, Ser. No. 273,377
Claims priority, application Japan, Jun. 14, 1980, 55-80482
Int. Cl.³ A61K *31/71*; C07G *11/00*
U.S. Cl. 424—181 **2 Claims**

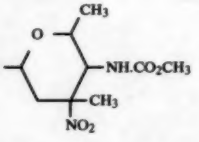
1. A composition of matter having an antibacterial activity which is represented by the formula (1)





(1)

wherein R_1 and R_2 may be the same or different substituents and represent a hydrogen atom or an acyl group and R_3 represents a hydrogen atom, an acyl group or a tetronitrose represented by the formula (2)



(2)

and the pharmaceutically acceptable salts thereof.

2. A pharmaceutical composition for eliciting an antibacterial response comprising a pharmaceutical carrier and, as an active ingredient, an antibacterially effective amount of the composition of matter of claim **1**.

4,393,057

PHARMACEUTICAL PREPARATIONS

Walter Boguth, Riehen, Switzerland, and Georges Hirth, Huningue, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 228,792, Jan. 27, 1981, Pat. No. 4,339,447.
This application Apr. 26, 1982, Ser. No. 371,400
Claims priority, application Switzerland, Feb. 7, 1980, 983/80
Int. Cl.³ A61K *31/625*
U.S. Cl. 424—229 **7 Claims**

1. A pharmaceutical preparation comprising an effective amount of a pharmaceutically active sulphonamide and a solvent containing a glycerol lower-alkyl ether selected from glycerol 1-methyl ether, glycerol 1-ethyl ether, glycerol 1,3-dimethyl ether and glycerol,1,2-dimethyl ether, said glycerol lower-alkyl ether and said solvent being present in an amount sufficient to dissolve said active ingredient.

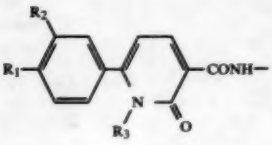
4,393,058

CEPHALOSPORIN COMPOUNDS

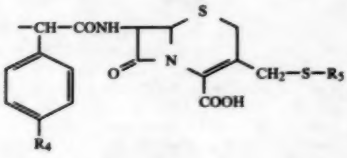
Osamu Makabe, Tokyo; Yasushi Murai, Yokosuka; Tuneo Okonogi; Masahiro Onodera, both of Yokohama; Yoshiyuki Koyama, Naka, and Takashi Yoshida, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,417
Claims priority, application Japan, Sep. 18, 1979, 54-118788
Int. Cl.³ C07D *501/36;* A61K *31/545*
U.S. Cl. 424—246 3 Claims

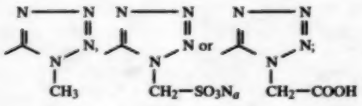
1. A cephalosporin compound of the formula (I)



(I)



wherein R_1 represents a methoxy group or a 3,4-dimethoxybenzyloxy group; R_2 represents a methoxy group; R_3 represents a hydrogen atom; R_4 represents a hydroxyl group; and R_5 represents



or a pharmaceutically acceptable salt thereof.

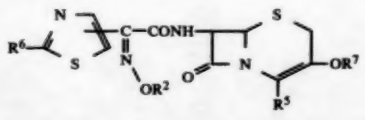
4,393,059

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Kiyoshi Tsuji, Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

Division of Ser. No. 886,340, Mar. 14, 1978. This application Sep. 15, 1981, Ser. No. 302,639
Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78
Int. Cl.³ C07D *501/20;* A61K *31/545*
U.S. Cl. 424—246 8 Claims

1. A syn compound of the formula:



wherein

R^2 is hydrogen or an aliphatic hydrocarbon which may be substituted with halogen, carboxy or pharmaceutically acceptable esterified carboxy,

R^5 is carboxy or pharmaceutically acceptable esterified carboxy,

R^6 is amino or protected amino and

R^7 is lower alkanesulfonyl or arenesulfonyl, and pharmaceutically acceptable salt thereof.

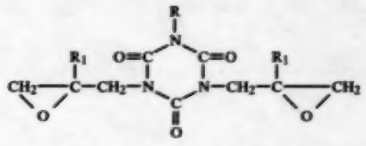
4,393,060

ISOCYANURIC ACID DERIVATIVES, METHOD OF PREPARATION, THERAPEUTIC COMPOSITIONS WITH A CYTOSTATIC ACTION AND THERAPEUTIC METHOD

Herbert Fischer; Manfred Budnowski, and Ulrich Zeidler, all of Dusseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 7, 1980, Ser. No. 194,908
Claims priority, application Austria, Oct. 8, 1979, 6552/79
Int. Cl.³ A61K *31/53, 31/535;* C07D *251/32, 413/08*
U.S. Cl. 424—248.5 10 Claims

1. A cytostatic composition consisting essentially of a cytostatically effective amount of at least one N-substituted-diglycidyl-isocyanurate having the formula:



wherein R has from 1 to 15 carbon atoms, which R is a hydrocarbon-containing radical selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, cycloalkyl, and unsaturated derivatives thereof, which R may be further substituted by: heterocycles selected from the group consisting of piperidine, hexamethylenimine, morpholine, benzthiazol-2-ylthio and benzimidazol-2-ylthio, and further substituents on said R selected from the group consisting of halogen, hydroxyl, amino, N-substituted amino having the formula:

$$—NHR_2 \text{ and } —NR_2R_3$$

wherein R_2 and R_3 together have a total of no more than 8 carbon atoms and are members selected from the group consisting of alkyl and alkyl substituted by hydroxy, halogen and alkoxy, mercapto, alkylmercapto, alkylmercapto substituted by hydroxy, halogen and alkoxy, arylmercapto, alkylsulfoxyl, arylsulfoxyl, alkoxy, aryloxy and alkanoyloxy and aroyloxy, and R_1 represents a member selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms, and a pharmaceutically acceptable carrier therefor.

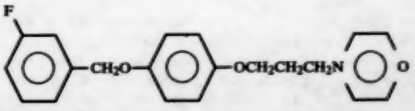
4,393,061

ANESTHETIC-ANTIPRURITIC MORPHOLINE COMPOUNDS, COMPOSITIONS AND USE

Cheng-Sein Yu, Kaohsiung, Taiwan, assignor to Stiefel Laboratories, Inc., Coral Gables, Fla.

Filed Jun. 21, 1982, Ser. No. 390,572
Int. Cl.³ C07D *295/08;* A61K *31/535*
U.S. Cl. 424—248.58 6 Claims

1. A compound selected from the group consisting of the free base of the formula:



and the pharmaceutically acceptable acid addition salts thereof.

6. A topical pharmaceutical composition comprising a compound according to claim 1 in an amount sufficient to produce a topical anesthetic-antipruritic effect, in combination with a carrier which is pharmaceutically acceptable for topical application.

4,393,062

PHARMACEUTICAL COMPOSITIONS AND METHOD FOR THE PRODUCTION OF AN ANTI-INFLAMMATORY EFFECT

David R. Brittain, and Robin Wood, both of Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England

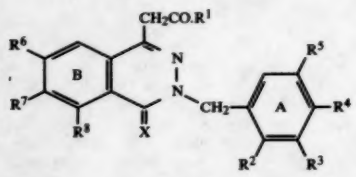
Division of Ser. No. 964,725, Nov. 29, 1978, Pat. No. 4,251,528. This application Oct. 6, 1980, Ser. No. 194,211

Claims priority, application United Kingdom, Dec. 29, 1977, 54142/77

Int. Cl.³ C07D 237/32; A61K 31/495

U.S. Cl. 424—250 5 Claims

1. A pharmaceutical composition suitable for use in producing an anti-inflammatory effect in a warm-blooded animal which comprises a compound of the formula:



I

wherein R^1 is hydroxy, R^2 is fluoro, R^3 and R^5 are hydrogen and R^4 is chloro, bromo or iodo; or R^2 and R^5 are hydrogen, and R^3 and R^4 are each independently chloro, bromo or iodo; and in either case R^6, R^7 and R^8 are hydrogen and X is oxygen; or a pharmaceutically acceptable base-addition salt thereof; together with a pharmaceutically acceptable diluent or carrier.

4,393,063

TREATMENT FOR GASTRIC LESIONS

Salvador E. Moncada, West Wickham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 907,355, May 18, 1978, Pat. No. 4,337,254. This application Jul. 6, 1981, Ser. No. 280,853

Claims priority, application United Kingdom, Aug. 23, 1977, 35261/77

Int. Cl.³ A61K 31/34, 31/44, 31/52, 31/505

U.S. Cl. 424—251 4 Claims

1. A method for prophylaxis and/or treatment of a gastric lesion in a mammal, which comprises simultaneously or sequentially internally administering 1 part by weight of (a) a compound selected from the group consisting of prostacyclin, dihydroprostacyclin, and their pharmaceutically acceptable salts, in an amount insufficient to cause vasodilation, and 1 to 200 parts by weight of (b) a phosphodiesterase inhibitor selected from the group consisting of theophylline, 3-isobutyl-1-methyl xanthine, dipyridamole, a pharmaceutically acceptable salt of theophylline, a pharmaceutically acceptable salt of dipyridamole, and a pharmaceutically acceptable salt of 3-isobutyl-1-methyl xanthine.

4,393,064

PROCESS AND COMPOSITION FOR TREATMENT OF LEUKEMIA AND PROCESS FOR PREPARING THE SAME

Joseph I. DeGraw, Jr., Sunnyvale, Calif., and Francis M. Sirotnak, New York, N.Y., assignors to SRI International, Menlo Park, Calif. and Sloan Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 664,213, Mar. 5, 1976, abandoned, and Ser. No. 761,152, Jan. 21, 1977, abandoned, and Ser. No. 883,627, Mar. 6, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 75,913

Int. Cl.³ A61K 31/505

U.S. Cl. 424—251 18 Claims

1. A pharmaceutical composition in tablet form for treating leukemia or an ascites tumor comprising an amount within the range from about 0.1 to about 500 mg of 10-deazaminopterin per tablet therapeutically effective to ameliorate leukemia or the ascites tumor, together with a pharmaceutically acceptable nontoxic carrier or diluent therefor.

4,393,065

ANIMAL FEED AND PROCESS

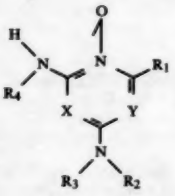
Melvin J. DeGeeter; John M. McCall, both of Kalamazoo, and Dirk L. Teagarden, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 161,943, Jun. 23, 1980, Pat. No. 4,316,901, and a continuation-in-part of Ser. No. 161,944, Jun. 23, 1980, Pat. No. 4,307,093, and a continuation-in-part of Ser. No. 161,945, Jun. 23, 1980, Pat. No. 4,282,228, and a continuation-in-part of Ser. No. 161,946, Jun. 23, 1980, Pat. No. 4,315,930, and a continuation-in-part of Ser. No. 161,976, Jun. 23, 1980, Pat. No. 4,308,271. This application Apr. 14, 1981, Ser. No. 249,762

Int. Cl.³ A61K 31/505, 27/00, 31/54, 31/53

U.S. Cl. 424—251 2 Claims

1. A process for obtaining increased meat, milk, egg or wool production in healthy animals comprising the administration to a healthy animal a long acting composition containing an effective amount of a compound of the formula



Ia

wherein

X is N;

Y is CR_5;

R is alkyl of from 1 to 8 carbon atoms, inclusive, including isomeric forms thereof;

R_1 is R or

R_2 and R_3 are the same or different and are hydrogen, provided that R_2 and R_3 are not both hydrogen, R, cycloalkyl of from 3 to 8 carbon atoms, inclusive, alkyl substituted cycloalkyl of the formula

alkenyl of from 2 to 8 carbon atoms, inclusive, including isomeric forms thereof, aralkyl wherein

Ar is phenyl or substituted phenyl wherein 1 or 2 hydrogens are replaced with chlorine, fluorine, bromine, iodine, R, —OR, or CF_3, and the substituents can be the same or different, and alkyl is from 1 to 4 carbon atoms, inclusive, including isomeric forms thereof; and P_2 and R_3 taken together with —N< is a heterocyclic moiety of from 3 to 8, inclusive, ring atoms and 1 or 2 hetero atoms selected from the group consisting of nitrogen, oxygen or sulfur or a substituted heterocyclic moiety wherein 0, 1, 2, or 3 of the carbon atoms of the heterocycle are substituted with R;

R_4 is hydrogen,

alkenyl of from 2 to 8 carbon atoms, inclusive, including isomeric forms thereof, cycloalkyl of from 3 to 7 carbon atoms, inclusive, or lower acyl wherein acyl is up to and including 5 carbon atoms;

R_5 is hydrogen, R, bromo or chloro;

R_6 is hydrogen,

or lower acyl;

R_7 is hydrogen or alkyl of from 1 to 5 carbon atoms, inclusive, including isomeric forms thereof;

n is an integer of from 2 to 7, inclusive, said composition being in the form of an implant, bolus, or sterile injectable.

4,393,066

METHOD FOR TREATMENT OF HERPETIC LESIONS

David M. Garrett, 5711 39th St., Groves, Tex. 77619, and Wallace R. Robin, 114 6th Ave., Nederland, Tex. 77627

Filed Jun. 5, 1981, Ser. No. 271,039
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 1 Claim

1. A method of treating herpetic lesions comprising the topical administration to the lesion site and surrounding tissue area of a patient suffering from said lesions of an amount of folic acid effective for treating said lesions.

4,393,067

NICOTINOYL ESTERS FOR ANALGESIC AND ANTI-INFLAMMATORY TREATMENT

Alberto Reiner, Como, Italy, assignor to D and D Srl, Milan, Italy

Continuation-in-part of Ser. No. 225,978, Jan. 19, 1981, abandoned. This application Nov. 25, 1981, Ser. No. 325,029
Claims priority, application Italy, Jan. 19, 1980, 19354 A/80
Int. Cl.³ A61K *31/435*; C07D *213/62*
U.S. Cl. 424—256 6 Claims

1. A method for the treatment of inflammation in a patient in need of such treatment, said method comprising administering to said patient a therapeutically effective amount of the nicotinoyl ester of (3-4)-O-isoproylidene pyridoxine.

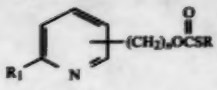
4,393,068

PYRIDYLALKYL THIOCARBONATES AS INSECT REPELLENTS

Rayman Y. Wong, 3411 Lowell Ave., Richmond, Calif. 94804

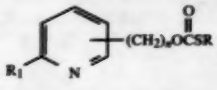
Filed Jan. 4, 1982, Ser. No. 337,039
Int. Cl.³ A01N *43/40*; C07D *213/46*
U.S. Cl. 424—263 84 Claims

1. A compound having the formula



in which R is alkyl, cycloalkyl, aralkyl, wherein alkyl is a group containing up to 20 carbon atoms chlorophenyl or chlorobenzyl, R_1 is hydrogen or lower alkyl, and n is 1, 2, or 3.

67. A method of repelling insects from a locus to be protected therefrom, comprising applying to said locus an effective insect repelling amount of a compound having the formula



in which R is alkyl, cycloalkyl, aralkyl, wherein alkyl is a group containing up to 20 carbon atoms chlorophenyl or chlorobenzyl, R_1 is hydrogen or lower alkyl, and n is 1, 2, or 3.

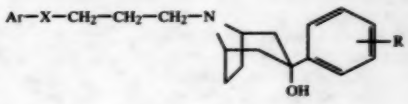
4,393,069

8-ARYLALKYL-3-PHENYL-3-NORTROPANOLS AND SALTS THEREOF

Adolf Langbein, Gau-Algesheim; Herbert Merz; Rainer Sobotta, both of Ingelheim am Rhein; Rudolf Bauer, Wiesbaden; Hans M. Jennewein, Walluf, and Joachim Mierau, Mainz, all of Fed. Rep. of Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Fed. Rep. of Germany

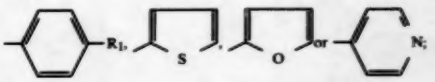
Filed Nov. 25, 1981, Ser. No. 324,680
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045688
Int. Cl.³ C07D *401/02*; A61K *31/46*
U.S. Cl. 424—265 6 Claims

1. A compound of the formula



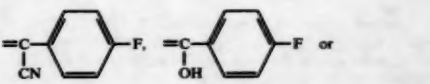
wherein

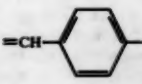
Ar is



R_1 is hydrogen, fluorine, bromine, methyl or methoxy;

X is =CO, =CH—CN, =CH—OH, —O—, —S—, —NH—,





and

R is hydrogen, 4-fluoro, 4-chloro, 4-trifluoromethyl, 3-trifluoromethyl, 3-trifluoromethyl-4-chloro, 4-methyl or 4-methoxy;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,393,070

DIHYDROPYRIDINE DERIVATIVE, AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Yoshinari Sato, Takaishi, and Tsutomu Teraji, Osaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

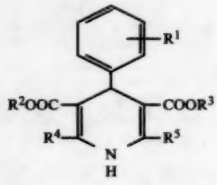
Division of Ser. No. 70,098, Aug. 27, 1979, Pat. No. 4,307,103. This application Dec. 4, 1980, Ser. No. 213,047

Claims priority, application United Kingdom, Sep. 8, 1978, 36132/78

Int. Cl.³ C07D *213/55;* A61K *31/44*

U.S. Cl. 424—266 7 Claims

1. A compound of the formula:



wherein

R^1 is cyano or trifluoromethyl,

R^2 is [N-lower alkyl-N-mono- or dihalophenyl(lower)alkyl-]amino(lower)alkyl;

R^3 and R^4 are each lower alkyl, and

R^5 is formyl, di(lower) alkoxymethyl or hydroxymethyl, and pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition for treatment of hypertension comprising, as an active ingredient, an effective amount of the compound of claim 1, in association with a nontoxic, pharmaceutically acceptable carrier or excipient.

4,393,071

METHOD OF TREATING GASTRIC, MAMMARY, LUNG AND UTERUS TUMORS

Naoharu Fujii, No. 6-10, Jingumae 3-chome, Shibuya-ku, Tokyo, and Noboru Iijima, No. 2-1, Kyobashi, Chuo-ku, Tokyo, both of Japan

Continuation-in-part of Ser. No. 14,428, Feb. 23, 1979, abandoned, and continuation of Ser. No. 559,018, Mar. 17, 1975, abandoned. This application Mar. 6, 1981, Ser. No. 241,308

Int. Cl.³ A61K *31/40, 31/555*

U.S. Cl. 424—274 8 Claims

1. A method of treating in an animal body malignant tumors selected from the group consisting of gastric tumor, mammary tumor, lung tumor, and uterus tumor, comprising the step of daily administering to the animal body of between 5 to 100 mg. of protoporphyrin.

4,393,072

THIENYLBENZOIC ACID DERIVATIVES

Wulf Merkel; Dieter Bormann; Dieter Mania, all of Kelkheim, and Roman Muschaweck, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

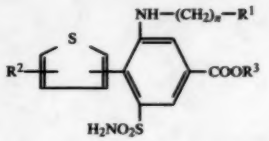
Continuation of Ser. No. is a continuation of Ser. No. 94,059, Nov. 14, 1979, abandoned. This application Sep. 16, 1982, Ser. No. 418,649

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849646

Int. Cl.³ A61K *31/38;* C07D *333/24*

U.S. Cl. 424—275 9 Claims

1. A thienylbenzoic acid compound of the formula



or a pharmaceutically acceptable salt thereof with an acid or base wherein,

R^1 is phenyl, thienyl, furyl, or is phenyl, thienyl or furyl substituted by halogen, $—CF_3$, $—CH_3$, or $—OCH_3$;

R^2 is hydrogen, halogen, or $—CH_3$;

R^3 is hydrogen, alkyl having from 1 to 4 carbon atoms, or benzyl; and

n is 1 or 2.

4,393,073

PHARMACEUTICAL PREPARATIONS

Walter Boguth, Richen, and Georges Hirth, Huningue, both of France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 228,792, Jan. 27, 1981, Pat. No. 4,339,447. This application Apr. 26, 1982, Ser. No. 371,621

Claims priority, application Switzerland, Feb. 7, 1980, 983/80

Int. Cl.³ A61U *31/07, 31/12, 31/33, 31/355*

U.S. Cl. 424—284 6 Claims

1. A pharmaceutical preparation comprising an effective amount of a vitamin selected from the group consisting of vitamin A acetate, vitamin K_1 and vitamin E and a solvent containing a glycerol lower-alkyl ether selected from glycerol 1-methyl ether, glycerol 1-ethyl ether, glycerol 1,3-dimethyl ether and glycerol, 1,2-dimethyl ether, said glycerol lower-alkyl ether and said solvent being present in an amount sufficient to dissolve said active ingredient.

4,393,074

FLUORINATED CARBAMATE INSECTICIDES

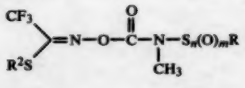
William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 139,797, Apr. 14, 1980, Pat. No. 4,323,578, which is a continuation-in-part of Ser. No. 65,485, Sep. 10, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,476

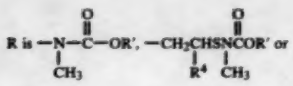
Int. Cl.³ A01N *43/08;* C07C *119/18;* A01N *37/52*

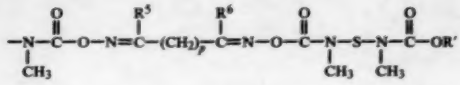
U.S. Cl. 424—285 9 Claims

1. A compound of the formula:

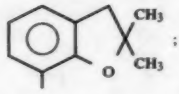


wherein

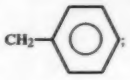




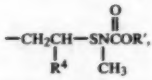
where
R′ is



R^2 is C_1–C_6 alkyl; C_3–C_6 alkenyl, or



R^4 is H;
n is 1 or 2;
m is 0 or 1;
p is 0, 1 or 2;
R^5 or R^6 are independently H, C_1–C_4 alkyl, phenyl or phenyl substituted with one atom of F, Cl, Br or CH_3;
provided that when:
(1) R is



n must be 1;
(2) n is 2, m must be 0.

4. An insecticide composition consisting essentially of a surfactant, diluent, and an effective amount of a compound of claim **1**.

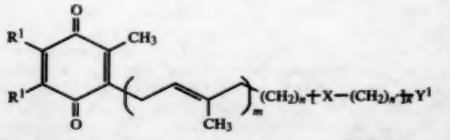
4,393,075

QUINONE COMPOUNDS AND THEIR USE IN SUPPRESSING THE PRODUCTION OF SRS-A IN MAMMALS

Shinji Terao, Toyonaka; Mitsuru Shiraishi, Suita, and Yoshitaka Maki, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

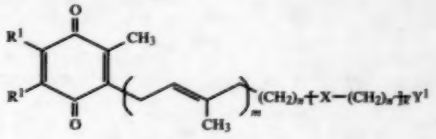
Filed Mar. 26, 1981, Ser. No. 248,042
Claims priority, application Japan, Apr. 14, 1980, 55-49433; Apr. 30, 1980, 55-58464; Dec. 27, 1980, 55-186622
Int. Cl.³ A61K *31/12, 31/275;* **C07C** *50/00*
U.S. Cl. 424—304 **14 Claims**

7. A compound of the formula:



wherein R^1 is methyl or methoxy, or the two R^1 groups jointly represent —CH=CH—CH=CH—,
X is —CH=CH— or —C≡C—,
Y^1 is hydrogen, carboxyl, cyano, C_{2-4} alkanoyloxy, benzoyloxy or —COZ in which Z is amino or mono- or di-C_{1-4} alkylamino,
m is zero or an integer of 1 to 3,
n is zero or an integer of 1 to 10,
n′ is an integer of 1 to 5,
k is an integer of 1 to 3, and
when k is 2 or 3, n′ is optionally variable within the range of 1 to 5 in each occurrence of the $—X—(CH_2)_{n'}$ group,
with the proviso that there are 8–15 carbon atoms in series between the quinone ring and Y^1,
or its hydroquinone form,
or a pharmaceutically acceptable salt thereof.

14. A method for suppressing the production of SRS-A in a mammal in need thereof, which comprises administering to said mammal an effective amount of a compound of the formula:



wherein R^1 is methyl or methoxy, or the two R^1 groups jointly represent —CH=CH—CH=CH—,
X is —CH=CH— or —C≡C—,
Y^1 is hydrogen, hydroxyl, carboxyl, cyano, C_{2-4} alkanoyloxy, benzoyloxy or —COZ in which Z is amino or mono- or di-C_{1-4} alkylamino,
m is zero or an integer of 1 to 3,
n is zero or an integer of 1 to 10,
n′ is an integer of 1 to 5,
k is an integer of 1 to 3, and
when k is 2 or 3, n′ is optionally variable within the range of 1 to 5 in each occurrence of the $—X—(CH_2)_{n'}$ group,
or its hydroquinone form,
or a pharmaceutically acceptable salt thereof.

4,393,076

ANTI-INFLAMMATORY AND ANALGESIC GEL COMPOSITION

Kanji Noda, Chikushino; Akira Nakagawa; Tetsuya Yamagata, both of Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

Continuation-in-part of Ser. No. 260,633, May 5, 1981, abandoned. This application Feb. 16, 1982, Ser. No. 348,887
Claims priority, application Japan, May 14, 1980, 55/65066; May 14, 1980, 55/65067
Int. Cl.³ A61K *31/19*
U.S. Cl. 424—317 **15 Claims**

1. An anti-inflammatory and analgesic gel composition comprising, by weight, 0.5–10% of ketoprofen as the effective ingredient, 2–40% of a glycol selected from the group consisting of propylene glycol, butylene glycol, polyethylene glycol, polypropylene glycol, polyethylene glycol dodecyl ether and glycerine, 20–55% of water, up to 60% of a lower alcohol selected from the group consisting of ethanol, denatured ethanol, propanol and isopropanol, 0.5–5% of a gelling agent selected from the group consisting of carboxyvinyl polymers, hydroxycellulose, methylcellulose, carboxymethylcellulose, hydroxypropylcellulose and alginic acid-propylene glycol ester and 0.1–3% of a neutralizing agent selected from the group consisting of triethanolamine, diethylamine, triethylamine, diisopropylamine and diisopropanolamine.

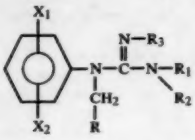
4,393,077

1-METHYLENE-1-PHENYLGUANIDINE COMPOUNDS

George H. Douglas, Malvern, and Henry F. Campbell, Lansdale, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Jul. 2, 1981, Ser. No. 280,072
Int. Cl.[3] A61K *31/155*; C07C *129/08*
U.S. Cl. 424—326 4 Claims

1. A method for ganglionic blocking which comprises administering an effective amount of a compound of the formula



and the pharmaceutically acceptable salts thereof, wherein

X_1 and X_2 each represent a member selected from the group consisting of hydrogen, halo, trifluoromethyl, acyl, alkyl, hydroxy, alkoxy and amino,

R_1, R_2, and R_3 each represent a member selected from the group consisting of hydrogen, lower alkyl and lower alkenyl and

R represents a member selected from the group consisting of cycloalkyl, cycloalkenyl and aryl,

also, R_3 and either R_1 or R_2 can constitute a methylene bridge, $—(CH_2)_2—$ or $—(CH_2)_3—$, resulting in the formation of a five- or six-membered ring.

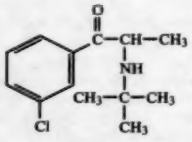
4,393,078

BUPROPION AND ETHANOL

Anthony W. Peck, Bromley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 15, 1982, Ser. No. 358,354
Int. Cl.[3] A61K *31/135*
U.S. Cl. 424—330 9 Claims

1. A method of reversing the impaired mental alertness effects of ethanol in a human, which comprises administering to a human who has consumed alcohol an effective, non-toxic amount of the compound of formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof to reverse the mental alertness effects of ethanol in the human.

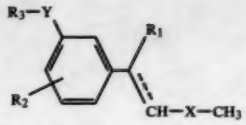
4,393,079

PHARMACEUTICAL COMPOSITIONS

William G. Cole, Twickenham; Alexander C. Goudie, Harlow, and Carl J. Rose, London, all of England, assignors to Beecham Group Limited, United Kingdom

Division of Ser. No. 599,638, Jun. 20, 1975, Pat. No. 4,062,978.
This application Dec. 15, 1976, Ser. No. 750,684
Claims priority, application United Kingdom, Jul. 4, 1974, 29651/74
Int. Cl.[3] A61K *31/12*; C07C *49/248*
U.S. Cl. 424—331 14 Claims

1. A pharmaceutical composition useful for the treatment of inflammation in humans and animals which comprises an anti-inflammatory amount of a compound of the formula



wherein

X is CO or CHOH;

Y is CO;

the dotted line represents a double bond which is present or absent;

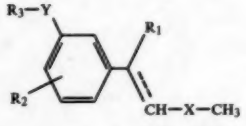
R_1 is hydrogen or methyl;

R_2 is hydrogen, fluorine, chlorine, bromine, methyl, trifluoromethyl, methoxyl, hydroxyl or nitro; and

R_3 is phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, methoxyl, ethoxyl, hydroxyl, trifluoromethyl, nitro, methylthio or methylsulphonyl;

in combination with a pharmaceutically acceptable carrier.

2. A method of treating inflammation in humans and animals which comprises administering to a human or animal in need thereof an anti-inflammatory amount of a compound of the formula



wherein

X is CO or CHOH;

Y is CO;

the dotted line represents a double bond which is present or absent;

R_1 is hydrogen or methyl;

R_2 is hydrogen, fluorine, chlorine, bromine, methyl, trifluoromethyl, methoxyl, hydroxyl or nitro; and

R_3 is phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, methoxyl, ethoxyl, hydroxyl, trifluoromethyl, nitro, methylthio or methylsulphonyl;

in combination with a pharmaceutically acceptable carrier.

4,393,080

ADHESIVE COMPOSITIONS

John M. Pawelchak, East Windsor; James L. Chen, East Brunswick; John G. Cryan, East Brunswick, and Anthony L. LaVia, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 24, 1981, Ser. No. 334,284
Int. Cl.[3] C09J *7/02*; B32B *9/00*
U.S. Cl. 428—355 31 Claims

15. A skin barrier comprising an adhesive layer having a thin continuous or discontinuous polymeric film laminated to one surface of the adhesive, said adhesive comprising a substantially homogeneous mixture on a percent weight basis of from about 30% to about 70% of a pressure sensitive viscous adhesive material and an optional thermoplastic elastomer said pressure sensitive adhesive material selected from the group consisting of natural rubber, silicone rubber, acrylonitrile rubber, polyurethane rubber, and polyisobutylenes and said optional thermoplastic elastomer selected from the group consisting of medium molecular weight polyisobutylenes, butyl rubber, and styrene copolymers and from about 3% to 60% by weight of one or more natural or synthetic polymers capable of developing elastomeric properties when hydrated selected

from the group consisting of gluten and long chain polymers of methyl vinyl ether/maleic acid.

4,393,081

METHYL 3-ACETAMIDO-2-(5-METHOXY-INDOL-3-YL) PROPANOATE AND HYPOTENSIVE USE THEREOF

Robert N. Schut, Edwardsburg, Mich.; Max E. Safdy, Elkhart, Ind., and Enrique Hong, Cerro San Francisco, Mexico, assignors to Miles Laboratories, Inc., Elkhart, Ind.

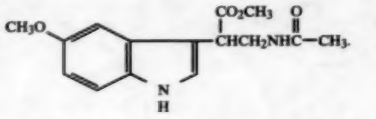
Filed Oct. 28, 1981, Ser. No. 315,638

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

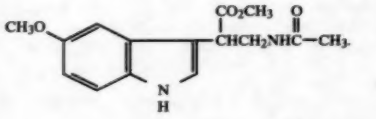
Int. Cl.³ A61K *31/405;* C07D *209/20*

U.S. Cl. 424—274 2 Claims

1. Methyl 3-acetamido-2-(5-methoxyindol-3-yl) propanoate of the formula:



2. A method of treating hypertension in a individual requiring such treatment which comprises administering to such individual an anti-hypertensively effective amount of a compound of the formula:



4,393,082

ION EXCHANGE MATERIALS TO INCREASE CONSUMPTION OF NON-PROTEIN NITROGEN BY RUMINANTS

Joe L. White, Lafayette, and Alvin J. Ohlrogge, West Lafayette, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 715,973, Aug. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 89,579, Nov. 16, 1970, abandoned. This application Jul. 5, 1977, Ser. No. 812,797

Int. Cl.³ A23K *1/22*

U.S. Cl. 426—2 19 Claims

1. A method for feeding ruminants urea or biuret as a non-protein nitroen (NPN) compound and for mitigating the toxic effects of high ammonium ion content in ruminal fluid produced by decomposition of said NPN compound to ammonia in the rumen during post-feeding fermentation and conversion to protein amino acids, which comprises:

(a) introducing into the rumen at least one foraminous bolus containing a crystalline alumino silicate cation exchange material in an amount sufficient to substantially reduce the ammonium ion content of the ruminal fluid during said post-feeding fermentation and decomposition of said NPN compound, said bolus being of sufficient size, weight, and/or shape to remain in the rumen,

(b) maintaining said bolus in the rumen during a large number of digestive cycles, and

(c) feeding said ruminant urea or biuret, the resulting ammonium ions formed in the post-feeding fermentaion and decomposition of said NPN compound being partially exchanged onto the cation exchange material to substantially reduce the ammonium ion content of the ruminal fluid, and thereafter being gradually released into the ruminal fluid by the regenerant action of saliva entering the rumen during rumination.

4,393,083

METHOD FOR PRODUCING GRAPE MUST AND WINE

Masazumi Watanabe, Kashiwa; Mikio Uehara, Noda; Yoshimi Shimazu, Noda; Jiro Ishiyama, Noda, and Motohiko Kato, Noda, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Jun. 23, 1981, Ser. No. 276,497

Claims priority, application Japan, Jul. 7, 1980, 55-91749; Jul. 8, 1980, 55-92285

Int. Cl.³ C12G *1/02;* C12P *7/20*

U.S. Cl. 426—15 7 Claims

1. A noble botrytized grape must enriched in glycerol content to about 6% (w/v) or more obtained by adding a compound selected from the group consisting of cyclic-3',5'-adenylic acid; an alkali metal salt of cyclic-3',5'-adenylic acid; an alkaline earth metal salt of cyclic-3',5'-adenylic acid; $N^6,O^{2'}$-dibutyl-cyclic-3',5'-adenylic acid and N^6-butylestercyclic-3',5'-adenylic acid to a grape must and fermenting the grape must aerobically with mycelia of Botrytis cinerea.

4,393,084

BREAD MIX AND PROCESS

Seymour Pomper, Stamford, and Glenn D. LaBaw, Greenwich, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 1, 1981, Ser. No. 268,703

Int. Cl.³ A21D *8/00, 10/00*

U.S. Cl. 426—19 26 Claims

1. A process for preparing bread which comprises: mixing water with a dry bread mix to form a dough, the dry mix comprising flour, from 1.5 to 2.5% quick-leavening active dry yeast, and from 0.1 to 0.75% of a dough conditioner selected from the group consisting of calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, and mixtures of these, all percentages based on the weight of the dry mix; shaping the dough into units for baking; proofing the shaped units for from about 30 to about 45 minutes; and baking.

4,393,085

ENZYME DIGESTION FOR A DOG FOOD OF IMPROVED PALATABILITY

Joseph E. Spradlin; Jeffrey D. Morgan, both of Bourbonnaise; Allan R. Olson, Ashkun, and Joseph P. Howley, Flossmoor, all of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 13, 1981, Ser. No. 292,473

Int. Cl.³ A23K *1/00, 1/18*

U.S. Cl. 426—28 17 Claims

1. A process for preparing a nutritionally-balanced dog food having improved palatability, said dog food comprising fat, protein, carbohydrates, vitamins and minerals and containing of a weight basis from 20% to 80% farinaceous ingredients and from 20% to 80% proteinaceous ingredients, including proteinaceous meaty material at from about 25% to about 55% by weight of the proteinaceous ingredients, said process comprising the steps of:

(a) preparing a slurry comprising water, from about 5% to about 25% of the total weight of said farinaceous ingredients, and a major portion of the proteinaceous meaty material;

(b) forming a reaction product by treating said slurry with added alpha-amylase and added protease enzymes in an amount and under conditions effective to convert at least a portion of the farinaceous material to a mixture of oligo saccharides ranging in size from 1 to 10 monomer units, and at least a portion of the proteinaceous material to a mixture of peptides ranging in size from 2 to 300 monomer units, and effective to reduce the viscosity of the slurry by 50%; and thereafter,

(c) incorporating the reaction product of the slurry into a dog food in an amount effective to provide a significant increase in the palatability of the dog food to dogs.

4,393,086

DIETARY PRODUCT CONTAINING GLUCOMANNAN POWDER AND METHOD FOR PREPARING

Yoshinari Masuyama, No. 5-19-19, Higashi Gotanda, Shinagawa-Ku, Tokyo, Japan 141

Continuation-in-part of Ser. No. 96,160, Nov. 20, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,382
Claims priority, application Japan, Oct. 19, 1979, 54-134156
Int. Cl.[3] A23L *1/30*
U.S. Cl. 426—74 3 Claims

1. A dietary powder composition in the form of a tablet which comprises 20 to 50 parts by weight of glucomannan powder having an average particle size of 100 to 200 mesh, 5 to 10 parts by weight of beef bone dust containing marrow and having an average particle size of 100 and 200 mesh, and 20 to 50 parts by weight of lactose powder having an average particle size of 80 to 150 mesh.

4,393,087

PROCESS FOR THE PRODUCTION OF A FLOATING AQUATIC FOOD PELLET

Richard D. Sullins, Manchester, Mo., and Kent J. Lanter, Millstadt, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Filed May 4, 1981, Ser. No. 259,882
Int. Cl.[3] A23K *1/175*
U.S. Cl. 426—74 29 Claims

1. A process for the production of a floating aquatic food pellet comprising:

(a) forming a first mixture of proteinaceous and farinaceous materials with fat and sufficient expanded grain particles to provide floatability for said pellets;

(b) separately forming a hardenable carbohydrate matrix and combining said matrix with said first mixture,

(c) pelleting the combined matrix and mixture by the application of heat and pressure with the matrix preventing compaction of the expanded grain particles to and form a floating aquatic food pellet with good structural integrity in water.

4,393,088

STERILIZING PROCESS FOR FOODS BY APPLYING MICROWAVES THERETO

Osamu Matsusaka, Yokohama, Japan, assignor to Mitsubishi Monsanto Chemical Company, Kanagawa, Japan

Filed Sep. 15, 1980, Ser. No. 187,621
Claims priority, application Japan, Sep. 26, 1979, 54-123660
Int. Cl.[3] A23L *3/10;* B65B *55/16*
U.S. Cl. 426—234 7 Claims

1. A sterilizing process for a food mixture by applying microwaves thereto, comprising the sequential steps of:

placing a solid food material into a container which is capable of transmitting microwaves therethrough; then

feeding a liquid material having an elevated temperature close to the temperature that said mixture is to be heated to and 80° C. to 100° C. higher than that of said solid food material into said container; whereby said container is completely filled with the mixture of said solid and liquid food materials;

hermetically sealing said container before said mixture of said solid and liquid food materials reaches an equilibrium temperature thereof to thereby allow for some contraction on cooling before applying the next step; and

applying microwaves under ambient pressure to said container before said mixture reaches an equilibrium temperature to raise the temperature of the mixture of said solid and said liquid materials in said sealed container to a sterilizing temperature of from 70° to 105° C., whereby said mixture becomes sterilized without damage to said container.

4,393,089

MICROBIAL HETEROPOLYSACCHARIDE

Roger B. Cox, Reading, and David C. Steer, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 166,220, Jul. 7, 1980, Pat. No. 4,329,448.
This application Dec. 16, 1981, Ser. No. 331,510
Claims priority, application United Kingdom, Jul. 10, 1979, 7924040; Dec. 20, 1979, 7943878
Int. Cl.[3] A23L *1/04, 1/24*
U.S. Cl. 426—573 6 Claims

1. An edible composition comprising a thickening or suspending amount of Biopolymer PS 87 wherein said Biopolymer PS 87 is a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 16 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of said Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value at 20° C. of at least 30 dynes/cm^2.

4,393,090

BEEF PRODUCT FOR COOKING ON A VERTICAL ROTISSERIE

James H. Coroneos, 11335 Frederick Rd., West Friendship, Md. 21043

Continuation of Ser. No. 166,481, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 917,077, Jun. 19, 1978, Pat. No. 4,245,373. This application May 14, 1982, Ser. No. 378,360
Int. Cl.[3] A23L *1/31*
U.S. Cl. 426—646 1 Claim

1. A beef product for cooking on a vertical rotisserie comprising ingredients which are listed in the order of predominance in the following percentages of the total product:

beef, 75.5 percent;

water, 9.0 percent;

onions, 7.5 percent;

textured vegetable protein, 4.5 percent;

salt, 1.5 percent;

paprika, 1.5 percent; and

spices, 0.5 percent;

said beef product prepared from said ingredients by the process comprising; cutting beef into small pieces and grinding said pieces in a mechanical grinder, regrinding the ground meat a second time;

preparing a mixture of the additive ingredients comprising, the water, onions, textured vegetable protein, salt, paprika, and spices;

spreading the ground beef on a working surface and introducing the mixture of additive ingredients evenly over the ground beef, kneading the combination of ground beef and the additive ingredients until the additive ingredients are thoroughly and evenly mixed throughout the ground beef;

placing the prepared mixture of ground beef and additive ingredients into a cylindrical mold and mechanically compressing the mixture in the mold to squeeze out substantially all of the entrapped air within the mixture, said compressing of the mixture in the mold providing a concave top surface which is necessary to permit subsequent expansion of the meat mixture to an essentially flat top surface when the compressive force is subsequently removed, said compressing of the meat mixture in said mold forming said meat mixture into an integrated unit comparable to an original meat mass, said flat surface being necessary for subsequent cooking of a plurality of molded meat units;

while the compressed mixture is still under pressure in the mold, inserting a hollow plastics skewer sleeve through a center guide opening in center of said mold and into the

center of the compressed mixture, using a solid mandrel to force the skewer sleeve into place;

removing the mandrel, leaving the skewer sleeve in place in the compressed mixture, removing the compression force from the mixture in the mold, removing the mold, the highly compressed molded unit of prepared beef being solid and unitary in form;

wrapping the molded unit carefully in suitable wrapping means and transporting the molded unit on a support means to a freezer means;

when frozen, the molded unit, separately or in conjunction with other molded units, is ready and easily handable for placing on a vertical rotisserie and is ready for cooking, said hollow plastics skewer sleeve providing a preformed aperture for a skewer which could not otherwise be inserted through a frozen meat unit; and

when cooking said product placing at least one frozen molded unit on a vertical rotisserie skewer by passing said skewer through said skewer sleeve in the center of said frozen molded unit, placing said skewer, with said molded unit thereon, on the vertical rotisserie and cooking, said flat top surface facilitating and accommodating the addition of other molded units on said skewer in a similar manner, a plurality of molded units thereby being capable of being cooked on a vertical rotisserie at the same time.

4,393,091

METHOD OF VACUUM DEPOSITING A LAYER ON A PLASTIC FILM SUBSTRATE

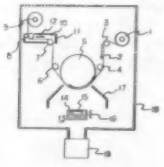
Koichi Shinohara, Kobe, and Takashi Fujita, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 10, 1981, Ser. No. 272,119

Claims priority, application Japan, Jun. 10, 1980, 55-78593; Jun. 10, 1980, 55-78609

Int. Cl.³ B05D *3/00, 3/06*

U.S. Cl. 427—13 **5 Claims**



1. A method of vacuum depositing a layer on a plastic film prior to winding the film comprising the steps of:

transporting the film along a metal surface which is movable with the film, said metal surface being grounded and which metal serves to control the temperature of the film in contact therewith by conducting heat away from said film;

rendering said film in an electret state with a surface potential higher than 150 V, prior to or at the same time as the film contacts the metal surface, whereby said film is electrostatically attracted to said metal surface, thereby increasing the efficiency of the heat conduction between the film and the metal surface;

depositing a material on the portion of said film which is opposite the portion in contact with said metal surface; and

neutralizing the surface potential of said film so as to render it into a non-electret state after said deposition step and prior to winding the film.

4,393,092

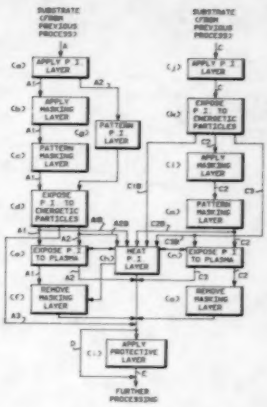
METHOD FOR CONTROLLING THE CONDUCTIVITY OF POLYIMIDE FILMS AND IMPROVED DEVICES UTILIZING THE METHOD

Graham P. Gill, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 12, 1982, Ser. No. 357,375

Int. Cl.³ B05D *3/06, 5/12*

U.S. Cl. 427—38 **20 Claims**



5. In a process for fabricating electronic devices utilizing a pattern of conductor regions in contact with a polymer layer, wherein portions of said polymer layer have been exposed to energetic particles, the improvement comprising, thereafter exposing said portions of said polymer layer to a low energy gaseous plasma.

4,393,093

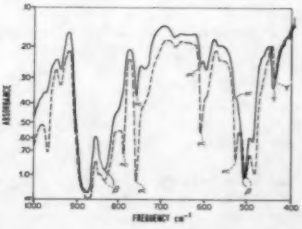
PREPARATION OF HIGH GAMMA (α)PHASE POLY(VINYLIDENE FLUORIDE) PIEZOELECTRIC MATERIALS

Oliver S. Sprout, Jr., Glenside, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 12, 1981, Ser. No. 272,823

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—40 **7 Claims**



1. A process for increasing the piezoelectric activity of a vinylidene fluoride polymer containing an α crystalline phase and having an α/β ratio of at least about 0.05 comprising treating the polymer with a glow discharge at reduced pressure to convert a portion of the α crystalline phase to γ crystalline phase and then poling the polymer in an electric field.

4,393,094

STABILIZATION OF ELECTRON BEAM CURABLE COMPOSITIONS FOR IMPROVED EXTERIOR DURABILITY

David L. Garrett, Jr., Southfield, and Joseph C. Cassatta, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 19, 1982, Ser. No. 369,946
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **49 Claims**

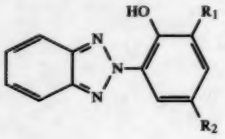
1. A coating composition polymerizable by low dosage ionizing radiation, which comprises an organic resin/monomer mixture of:

(A) between about 97 and about 3 weight percent alpha-beta olefinically unsaturated organic resin containing between about 0.5 and about 5 vinyl unsaturation units per 1000 units molecular weight of said resin; and

(B) between about 3 and about 97 weight percent vinyl monomers polymerizable with said resin upon exposure to radiation, said vinyl monomers including N-vinyl-2-pyrrolidone in an amount of between about 3 and about 20 weight percent based on the total weight of (A) and (B); and

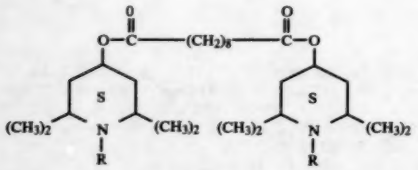
(C) about 0.5 to about 5.0 parts each per 100 parts of the total of said organic resin and said monomer of:

(i) benzotriazole selected from the group consisting of compounds having the formula:



wherein R_1 or R_2=H or an alkyl group of C_1–C_{25}; and

(ii) hindered amine selected from the group consisting of amine having the formula:



wherein R=H or methyl.

32. A method for coating a substrate, the coating composition polymerizable by low dosage ionizing radiation, which comprises:

(A) applying a first coating composition comprising up to about 60 weight percent pigment to the surface of a prepared substrate;

(B) curing said first coating composition by exposure to an electron beam until an adherent dry coating is formed;

(C) applying a second coating composition comprising 0–10 weight percent pigment to the coated surface of said substrate; and

(D) curing said second coating composition by exposure to an electron beam until an adherent dry coating is formed;

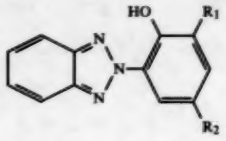
wherein said first coating composition and said second coating composition comprises an organic resin/monomer mixture of:

(A) between about 97 and about 3 weight percent alpha-beta olefinically unsaturated organic resin containing between about 0.5 and about 5 vinyl unsaturation units per 1000 units molecular weight of said resin; and

(B) between about 3 and about 97 weight percent vinyl monomers polymerizable with said resin upon exposure to radiation, said vinyl monomers comprising N-vinyl-2-pyrrolidone which is included in said composition in an amount of between about 3 and about 20 weight percent based on the total weight of (A) and (B); and

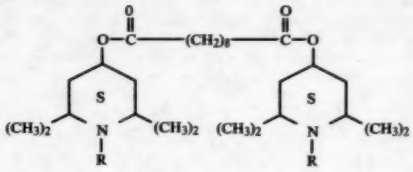
(C) about 0.5 to about 5.0 parts each per 100 parts of the total of said organic resin and said monomer of:

(i) benzotriazole selected from the group consisting of compounds having the formula:



where R_1 or R_2=H or an alkyl group of C_1–C_{25}; and

(ii) hindered amine selected from the group consisting of amines having the formula:



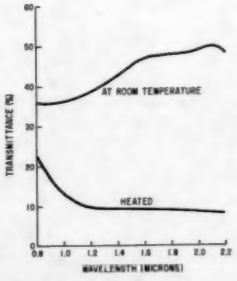
wherein R=H or methyl.

4,393,095

CHEMICAL VAPOR DEPOSITION OF VANADIUM OXIDE COATINGS

Charles B. Greenberg, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1982, Ser. No. 344,257
Int. Cl.³ B05D *5/12, 3/02;* **C03C** *17/245*
U.S. Cl. 427—87 **17 Claims**



1. A method for the chemical vapor deposition of vanadium oxide films comprising the steps of:

a. heating a glass substrate to a sufficient temperature to convert a vanadium compound to vanadium oxide;

b. vaporizing a liquid vanadium compound;

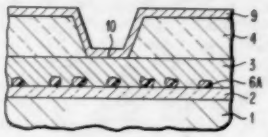
c. contacting a surface of said heated glass substrate with the vapor of said vanadium compound to deposit a vanadium oxide film on the glass surface.

4,393,096

ALUMINUM-COPPER ALLOY EVAPORATED FILMS WITH LOW VIA RESISTANCE

Joseph J. Gajda, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 321,833, Nov. 16, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,174
Int. Cl.³ H01L 21/285
U.S. Cl. 427—90 4 Claims



1. A method of fabricating thin film interconnected metallization on a dielectric coated integrated circuit substrate having ohmic contact via openings through said dielectric to elements of said circuit, comprising:

forming a vacuum environment about said substrate;

heating said substrate in said vacuum environment to between about 180° C. to about 200° C. to condition said substrate for deposition of first level metallization film;

discontinuing said heating and coincidently initiating evaporation of said first level metallization to deposit, during cooling of said substrate, a first aluminum-copper metal film over said dielectric and in said ohmic contact via openings;

defining in said first metallization film a predetermined interconnection pattern to said circuit elements;

depositing a dielectric layer over said first metallization level and said dielectric coating;

forming a second pattern of via openings in said dielectric layer to expose selected portions of said first metallization pattern;

dry etching to sputter clean said exposed first level metallization pattern and said dielectric layer in an inert atmosphere and at ambient temperatures;

initiating evaporation of a second level aluminum-copper film at ambient temperatures over said dielectric layer and in said second vias and

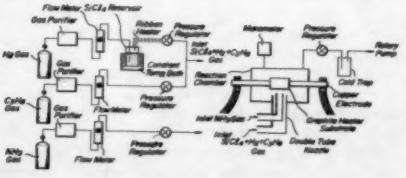
coincidentally initiating heating of said substrate to a temperature in the range of about 150° C. to about 200° C. over the deposition time of said evaporation of said second level metallization.

4,393,097

ELECTRICALLY CONDUCTIVE Si_3N_4-C SERIES AMORPHOUS MATERIAL AND A METHOD OF PRODUCING THE SAME

Toshio Hirai, 4-91, Takamori 3-Chome, and Takashi Goto, 2-12-304, Kuromatsu 3-Chome, both of Izumi, Japan

Filed Jul. 18, 1980, Ser. No. 170,168
Claims priority, application Japan, Jul. 24, 1979, 54-93942
Int. Cl.³ B05D 1/12; C23C 11/00; B32B 9/04
U.S. Cl. 427—94 14 Claims



1. A method of producing massive and pure Si_3N_4-C series amorphous material composed of a deposited amorphous Si_3N_4 matrix and codeposited carbon uniformly distributed in said matrix, having an electrical conductivity σ of a formula

$$\sigma=\sigma_0 \exp(-E/kT)$$

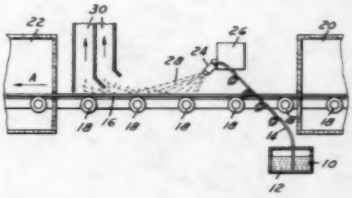
wherein σ_0 is an electrical conductivity at 0° K., E is a value of 0.02–0.06 eV, k is the Boltzmann constant and T is an absolute temperature, a carbon content of about 0.2–10% by weight, an electrical conductivity σ of about 10^{-3} to 10^{-1} Ω^{-1} cm^{-1} at a temperature from ambient to about 900° C., a density of about 2.7 to 3.0 g/cm³, a thermal conductivity of about 0.004–0.010 cal/cm-sec-K at ambient temperature, a specific heat of about 0.16 cal/g-K at ambient temperature, a thermal diffusivity of about 0.010–0.022 cm^2/sec at ambient temperature, and a micro Vickers hardness of about 2,500–3,500 kg/mm² (100 g load) at ambient temperature by chemical vapor deposition process, which comprises reacting $SiCl_4$ as silicon source gas, a nitrogen source gas and a hydrogen source gas with a carbon source gas at a deposition condition of a deposition temperature of about 1,100° to 1,300° C. under a reduced total pressure of about 30–70 mmHg in a reaction furnace to deposit the Si_3N_4-C series amorphous material on a surface of a substrate selected from the group consisting of graphite, silicon carbide and silicon nitride, the substrate being heated to said deposition temperature.

4,393,098

PROCESS FOR DEVELOPING A COATING FILM ON A HEATED GLASS SHEET

Wilbur G. Stinson, Southgate; Lawrence J. Schwei, Ypsilanti, and Sandy T. S. Vong, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01036, § 371 Date Jul. 29, 1982, § 102(e) Date Jul. 29, 1982
PCT Filed Jul. 29, 1982, Ser. No. 425,195
Int. Cl.³ B05D 1/12; C03C 17/23
U.S. Cl. 427—168 7 Claims



1. A process for developing a coating film on a surface of a sheet of glass, the sheet of glass being at a temperature in a range of 510°–625° C., which process is characterized by the step of:

engaging the surface of the heated glass sheet with a spray powder composition which comprises a plurality of hollow, generally spherical particles, each particle generally being formed from heat decomposable, organo-metallic salts of at least two metals.

4,393,099

METHOD FOR WINDING VULCANIZABLE TAPE

Alfio Deregibus, Padua, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 32,629, Apr. 23, 1979, abandoned, which is a division of Ser. No. 841,786, Oct. 13, 1977, Pat. No. 4,177,755. This application Oct. 6, 1980, Ser. No. 194,177
Claims priority, application Italy, Apr. 5, 1977, 23159 A/77
Int. Cl.³ B05D 1/36, 3/12
U.S. Cl. 427—177 3 Claims

1. A method, for the formation of a tape having raw vulcanizable rubber exposed at one major face of the tape and fabric

exposed at the other major face of the tape, which comprises the steps of:

(i) entraining the tape about successive spaced guide rollers such that the portion of tape lying between the rollers is substantially horizontal and has said one major face of raw vulcanisable rubber exposed upwardly;

(ii) depositing downwardly onto said upwardly exposed substantially horizontal major face of said tape portion a layer of zinc stearate powder to provide a powder-bearing face on which some of said powder is secured by tackiness

of the rubber to serve as an anti-adherent, whereas other of said powder remains loose on said upwardly exposed face;

(iii) causing said tape as it leaves the downstream one of said guide rollers to have a portion of its length passing upwardly at an inclination, and

(iv) acting with a rotary brush, disposed at an intermediate position along the upwardly inclined portion of tape, on said powder-bearing face for removing from said face that powder which remains loose on said face.

4,393,100

METHOD OF COATING A FUSED SILICA ENVELOPE

Ralph M. Potter, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 107,253, Dec. 26, 1979, Pat. No. 4,339,686.
This application Aug. 24, 1981, Ser. No. 295,462
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—181 **1 Claim**

1. A method of applying a coating of fiber like shaped particles selected from the group consisting of refractory metal oxides, oxynitrides, and nitrides or mixtures thereof to the interior surface of a fused silica envelope comprising:

an initial heating of said envelope above red heat to assure surface cleanliness and dryness;

coating a quantity of said film like shaped particles with an ultrafine, reactive powder that sinters or melts when strongly heated;

mulling said coated fiber like shaped particles into a viscous solution having a solvent and a solute wherein said solute is an acceptable binder, said mulling resulting in suspension of said coated fiber like shaped particles in said solution;

applying said suspension to said envelope interior;

vaporizing said solvent;

removing said binder by heating said envelope; and

applying additional heat to said envelope to fuse said powder to said fiber like shaped particles and thereby bind said fiber like shaped particles to each other and cause adhesion of said fiber like shaped particles to said envelope.

4,393,101

DIETHYNYLBENZENE-ETHYNYLPYRENE COPOLYMERS

Norman Bilow, Encino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 307,345, Sep. 30, 1981, Pat. No. 4,369,297.
This application Jun. 11, 1982, Ser. No. 387,580
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—228 **1 Claim**

1. A method for the production of a resinous impregnated carbon-carbon composite ablative material which comprises the steps of (1) forming an interwoven graphite fiber structure, (2) impregnating said structure with a matrix resinous precursor composed of a polymerizable mixture of diethynylbenzene and ethynylpyrene, (3) heating said impregnated structure at a temperature and for a period of time sufficient to effect the copolymerization of said mixture (4) further heating said polymerized structure at a temperature, pressure and period of time sufficient to pyrolyze said structure (5) graphitizing said pyrolized structure and (6) recovering the resulting carbon-carbon composite structure.

4,393,102

NET FINISHING COMPOSITION AND PROCESS FOR USING SAME

Richard J. Guglielmo, Sr., 140 Walnut St., Northvale, N.J. 07647

Filed Mar. 20, 1978, Ser. No. 888,373
Int. Cl.³ B05D *5/00, 1/18;* C08K *5/07;* C08L *27/06*
U.S. Cl. 427—243 **14 Claims**

1. A concentrate solution for preparing a net finishing solution for treating a net substrate to improve the physical properties thereof which comprises:

a solution of a low molecular weight, high acetate content, vinyl chloride-vinyl acetate copolymer; a monomeric plasticizer and a polymeric plasticizer in a solvent system, said copolymer having a molecular weight of from 20,000 to 65,000 and having an acetate content of from about 10 to about 20 percent by weight, said monomeric and polymeric plasticizers being present in an amount of from about 40 to 60 parts per 100 parts of said copolymer, the ratio of said monomeric plasticizer to said polymeric plasticizer being in the range of from 1:1 to 3:1, said solvent system being present in an amount to effect a solids content of said concentrate solution of between about 45 to 55 percent by weight.

9. A process for treating a net substrate formed of a synthetic material to improve the physical properties thereof, which comprises:

(a) coating said net substrate with a net finishing solution comprised of a low molecular weight, high acetate content vinyl chloride-vinyl acetate copolymer, a monomeric plasticizer and a polymeric plasticizer in a solvent system, said copolymer having a molecular weight of from 20,000 to 65,000 and having an acetate content of from about 10 to about 20 percent by weight, said monomeric and polymeric plasticizers being present in an amount of from about 40 to 60 parts per 100 parts of said copolymer, the ratio of said monomeric plasticizer to said polymeric plasticizer being in range of from 1:1 to 3:1, said solvent system including ketones and being present in an amount to result in a solids content of from 20 to 40 percent by weight of said net finishing solutions; and

(b) drying said coated net substrate.

4,393,103

ERASABLE DENSE PAPER AND IMPROVED METHOD OF MANUFACTURING

William G. Louden, c/o Louden and Company, Erwinna, Pa. 18920

Filed Aug. 28, 1981, Ser. No. 297,104
Int. Cl.³ B05D 3/02; B32B 23/08, 27/10
U.S. Cl. 427—391 15 Claims

1. A process for manufacturing dense paper comprising the steps, performed in the following sequence, of:

advancing a web of paper having a dry uncalendered density in a range of between about 7 to about 14 lbs./mil.;

applying to the advancing web an aqueous dispersion containing a blend of a rigid polymeric material and an inorganic filler, said blend consisting essentially of from about 35 to about 90% of said polymeric material, from about 10 to about 65% of said inorganic filler, and an organic compound of tin in a range of about 0.10% to about 2.0%, said percentages being by weight based on the non-tin portion of the weight of the blend, said rigid polymeric material having a glass transition temperature in a range of between about 15 to about 60° C.;

removing the excess dispersion from said web; and

heating said web after the excess dispersion has been removed to fuse said blend to said web so that the resulting paper comprises in a range of between about 8.5% to about 50%, by weight of the blend, said weight being based on the dry weight of the web.

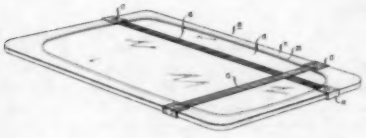
13. The process according to claim 1 wherein said polymeric material of said blend is selected from the group of materials consisting of polyvinyl acetate, polyacrylate, and polyvinyl chloride.

4,393,104

TABLE PLACEMAT

Helen M. Fink, 8 Indian Dawn, Wayland, Mass. 01778, assignor to Helen M. Fink, Hastings-on-Hudson, N.Y.

Filed May 18, 1981, Ser. No. 264,705
Int. Cl.³ A47G 23/00; B65D 65/02
U.S. Cl. 428—7 7 Claims



1. A placemat of a type placed on a tabletop for organizing a table setting, the placemat comprising:

rigid support means for defining a predetermined shape of the placemat, said rigid support means being formed of a substantially flat, rigid material having a perdetermined thickness and respective first and second surfaces arranged parallel to the tabletop, said first surface facing away from the tabletop and having a predetermined surface area, said second surface facing toward the tabletop;

first cover means removable attached to said rigid support means, said first cover means being formed of a flexible material having a surface area greater than said predetermined surface area of said first surface of said rigid support means, said first cover means being arranged over said first surface of said rigid support means so as to have an extending portion of said first cover means which extends beyond said predetermined shape of the placemat, said extending portion of said first cover means being drawn around said predetermined thickness of said rigid support means so as to cover at least partially said second surface of said rigid support means, said extending portion thereby being interposed between said rigid support means and the tabletop when the placemat is placed thereon;

first cover holding means on said extending portion of said first cover means for maintaining said extending portion over said second surface of said rigid support means;

second cover means removably arranged over a predetermined portion of said first cover means, said second cover means being formed of a flexible material having a graphical pattern thereon, said graphical pattern having a selectable one of a perdetermined significance and a complementary coordinated design with that of said first cover; and

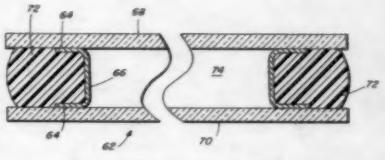
second cover holding means formed of an elastomeric material for applying a tensile force to said second cover means and thereby holding said second cover means over said predetermined portion of said first cover means, said second cover holding means being arranged to be interposed between said rigid support means and the tabletop when the placemat is placed thereon.

4,393,105

METHOD OF FABRICATING A THERMAL PANE WINDOW AND PRODUCT

Wallace S. Kreisman, Malden, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed Apr. 20, 1981, Ser. No. 255,641
Int. Cl.³ E06B 3/24
U.S. Cl. 428—34 6 Claims



1. A method of fabricating a thermal pane window comprising:

(a) providing an assembly of at least two panes of glass in spaced parallel relation to each other so as to define a space therebetween and separated all around the edges by a metal spacer frame;

(b) inserting a spacer electrode within said metal spacer frame;

(c) roll bonding said assembly all around said edges by concurrently applying heat and pressure to one point at a time along said edges while passing an electric current across the glass-metal, glass interfaces at said one point, said pressure being applied to said one point being about 1000 p.s.i., said roll bonding said assembly hermetically sealing said space between said panes of glass;

(d) evacuating said hermetically sealed space to about one torr or less; and

(e) sealing off said evacuated space.

6. A thermal pane window exhibiting no corrosion and condensation characteristics despite prolonged use comprising:

(a) at least two panes of glass in parallel spaced relation to one another and separated by a thin metal spacer frame said spaces offset from the edges of said panes of glass along opposed interfaces formed between said spacer frame and said panes of glass, said spacer frame being electrostatically sealed to said panes of glass along said opposed interfaces hermetically sealing the space between said panes, said metal spacer frame being formed of aluminum alloy, and a plastic material disposed in and occupying the space between said panes of glass outwardly of said thin metal spacer frame toward the edges of said panes of glass, said plastic material provides structural strength and rigidity to said thermal pane window; and

(b) a low heat-transfer gas devoid of oxygen and moisture contained within said space, said low heat-transfer gas being selected from the group including argon, krypton, and Freon R-12.

4,393,106

LAMINATED PLASTIC CONTAINER AND PROCESS FOR PREPARATION THEREOF

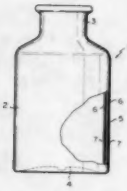
Yoshitsugu Maruhashi, Yokohama; Isao Tanikawa, Ayase; Sadao Hirata, Yokohama; Jinichi Yazaki, Tokyo, and Kozaburo Sakano, Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,952

Claims priority, application Japan, Oct. 31, 1980, 55-152243; Oct. 31, 1980, 55-152245

Int. Cl.³ B65D *23/00*; B32B *31/00*; B29D *9/04*; B05D *1/36*

U.S. Cl. 428—35 **16 Claims**



1. A laminated plastic container in the form of a bottle, the wall of which comprises a substrate formed of a melt-moldable plastic material, a coating layer formed on at least one surface of the substrate, said coating layer being composed of a copolymer consisting essentially of 99 to 70% by weight of vinylidene chloride and 1 to 30% by weight of at least one acrylic or methacrylic monomer and further including up to 100 parts by weight of at least one member selected from other ethylenically unsaturated monomers per 100 parts by weight of the total amount of said two monomers, said copolymer having an oxygen permeation coefficient of less than 9×10^{-14} cc.cm/cm^2.sec.cmHg as measured at a temperature of 20° C. and a relative humidity of 100% and a water vapor permeability coefficient of less than 3×10^{-3} g.cm/m^2.day as determined according to the method of JIS Z-0208, and a protecting surface layer of a film-forming synthetic resin other than a vinylidene chloride resin having an Izod impact strength of at least 1.1 kg/cm^2 as measured at 5° C. according to the method of ASTM D-256, said protecting surface layer being formed by coating an aqueous latex or organic solvent solution of the synthetic resin on the surface of the coating layer of the vinylidene chloride copolymer, the weight per unit inner volume of said substrate being in the range of from 0.001 to 5 g/ml, said coating layer of the vinylidene chloride copolymer having a thickness of 1 to 30μ; and said protecting surface layer having a thickness of 3 to 700μ.

16. A process for the preparation of laminated plastic containers, which comprises coating an aqueous latex or organic solvent solution of a copolymer consisting essentially of 99 to 70% by weight of vinylidene chloride and 1 to 30% by weight of at least one acrylic or methacrylic monomer and further including up to 100 parts by weight of at least one member selected from other ethylenically unsaturated monomers per 100 parts by weight of the total amount of said two monomers on at least one surface of a preform composed of a heat-moldable, orientable thermoplastic polymer, injecting or extruding a heat-moldable, orientable thermoplastic polymer on the coated surface of the preform to form a multi-layer parison, and drawing the multi-layer parison in the axial direction under such temperature conditions that molecular orientation is caused in at least one of the thermoplastic polymer on the inner surface side and the thermoplastic polymer on the outer surface side, while drawing the multi-layer parison in the circumferential direction by blowing the thickness of the copolymer layer being 1 to 30μ and that of the heat-moldable orientable thermoplastic polymer layer being 3 to 700μ.

4,393,107

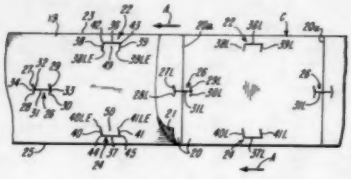
COMPOSITE LABEL WEB

William A. Jenkins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 2, 1981, Ser. No. 239,817

Int. Cl.³ B32B *3/10, 3/16*

U.S. Cl. 428—42 **26 Claims**



1. A composite label web for use in a label dispensing apparatus, the composite web comprising: a longitudinally extending carrier web, a series of labels releasably adhered by a coating of pressure sensitive adhesive to the carrier web, the composite web being wound into a roll and having an outer free end, longitudinally spaced groups of cuts in the carrier web, at least some groups of cuts including a single lateral cut at a leading location with respect to the outer free end of the composite web and a single lateral cut at a trailing location with respect to the outer free end of the carrier web, a generally longitudinal cut converging toward the respective end portions of the lateral cuts, the lateral cut of each group at the leading location and the respective longitudinal cut making an obtuse angle and the lateral cut of each group at the trailing location and the respective longitudinal cut making an acute angle, and wherein each lateral cut of said some groups is disposed on only one side of the respective longitudinal cut.

2. A composite label web for use in a label dispensing apparatus, the composite web comprising: a longitudinally extending carrier web, a series of labels rreleasably adhered by a coating of pressure sensitive adhesive to the carrier web, the composite web being wound into a roll and having an outer free end, longitudinally spaced groups of cuts in the carrier web, at least some groups of cuts including two and only two lateral cuts, one lateral cut being at a leading location with respect to the outer free end of the composite web and the other lateral cut being at a trailing location with respect to the outer free end of the web, a generally longitudinal cut converging toward the respective end portions of the lateral cuts, the lateral cut of each said group at the leading location and the respective longitudinal cut making an obtuse angle, the lateral cut of each said group at the trailing location and the respective longitudinal cut making an acute angle, and wherein each lateral cut is disposed at one side of the respective longitudinal cut.

23. A composite label web for use in lateral dispensing apparatus, the composite label web comprising: a longitudinally extending carrier web, a series of labels releasably adhered by a coating of pressure sensitive adhesive to the carrier web, the composite web being wound into a roll and having an outer free end, longitudinally spaced groups of cuts in the carrier web, the groups being disposed closely adjacent one side edge of the carrier web, each group including a generally longitudinally extending cut and at least one lateral cut, the longitudinal cut having a leading location with respect to the outer free end of the composite web, a said lateral cut converging from the outer free end of the composite web toward the leading loca-

tion of the longitudinal cut of the respective group, all the lateral cuts of each group being disposed on the side of the respective longitudinal cut away from the adjacent side edge of the carrier web, wherein each longitudinal cut has a trailing location with respect to the outer free end of the composite web, and each group of cuts includes a lateral cut converging from the outer free end of the composite web toward the trailing location of the respective longitudinal cut, wherein the lateral cuts of each group are parallel.

4,393,108

SIMULATED CERAMIC TILE

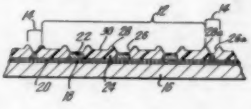
John C. Barker, Cowansville, and Ivan P. McLaughlin, Dunham, both of Canada, assignors to J. J. Barker Company Limited, Canada

Continuation of Ser. No. 52,008, Jun. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 808,662, Jun. 21, 1977, Pat. No. 4,169,907, which is a continuation-in-part of Ser. No. 550,875, Feb. 19, 1975, abandoned. This application Jul. 13, 1981, Ser. No. 340,992

Claims priority, application Canada, Nov. 15, 1974, 213914

The portion of the term of this patent subsequent to Oct. 2, 1996, has been disclaimed.

Int. Cl.³ B32B *3/00, 3/10*

U.S. Cl. 428—44 **15 Claims**

1. A decorative simulated ceramic tile comprising a substrate having a surface coated with an under-coat effective to provide a coloured, printable base; an inked layer comprising a layer of coloured ink lines of a silicone-containing ink forming a printed pattern on said printable base, said printed pattern being clearly visible; and a colouring pigment-containing top coat of a hard resinous, substantially silicone-free film-forming material, said top coat containing about 1% to about 4% by weight of said pigment; said top coat having a variable height thickness defining a contour of valleys, hills, and plains, wherein the intensity of colour in the top coat varies with the variation in the contour, the valleys having a top coat thickness less than 1 mil and occurring over said ink lines such that the colour of the ink is not obscured, and the hills lying adjacent said ink lines, said colour in the top coat providing a contrast with the colour in the under-coat and with the colour in the printed pattern, the silicone content of said inked layer being sufficient to repel said top coat to create the ceramic effect without deleteriously affecting the adherence of said top coat.

5. A panel defining a plurality of decorative simulated ceramic tiles comprising a substrate having a surface coated with an under-coat effective to provide a coloured, printable base; a printed ink layer comprisng a layer of coloured ink lines of silicone-containing ink defining a plurality of individual complete designs on said printable base, each of said designs being associated with a defined rectangular area, said layer of ink lines being clearly visible; and a colouring pigment-containing top coat of a hard resinous, substantially silicone-free film-forming material, said top coat containing about 1% to about 4% by weight of said pigment; said top coat having a variable depth and defining a contour of valleys, hills, and plains, wherein the intensity of colour in the top coat varies with the variation in the contour; the valleys having a top coat thickness less 1 mil and occurring over said ink lines such that the colour of the ink is not obscured, and the hills lying adjacent said ink lines; said colour in the top coat providing a contrast with the colour in the under-coat and with the colour in the printed pattern, the silicone content of said inked layer being sufficient to repel said top coat to create the ceramic effect without deleteriously affecting the adherence of said top coat.

4,393,109

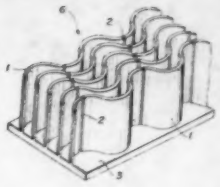
EXTRUDED FIN-TYPE WEATHERSTRIP

Gerald Kessler, 302 McClurg Rd. at Southern Blvd., Box 389, Youngstown, Ohio 44501

Filed Dec. 23, 1981, Ser. No. 333,912

Int. Cl.³ B32B *1/04, 27/06*

U.S. Cl. 428—119 **16 Claims**



1. An integrally extruded resilient all plastic fin-type weatherstrip comprising an elongated longitudinal substrate from which integrally projects vertically therefrom at least one thin, flexible, deformable, wavy S-configured fin member, said at least one fin member being unsli: along the length thereof.

4,393,110

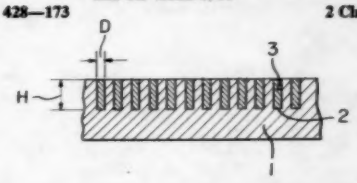
MAGNETIC RECORDING MEDIUM

Kazumasa Fukuda, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,052

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—173 **2 Claims**



1. In a magnetic recording medium having a high density of magnetic recording including a non-magnetic substrate having fine holes in a direction of thickness and a magnetic material filled in said fine holes, an improvement wherein said fine holes have a diameter ranging from 200 Angstroms to 5000 Angstroms and a depth ranging from 2000 Angstroms to 5 microns at a ratio of depth to diameter of substantially 10.

4,393,111

FABRICATION OF CONDUCTOR-CLAD COMPOSITES USING MOLDING COMPOUNDS AND TECHNIQUES

Theodore H. Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 121,821, Feb. 15, 1980, Pat. No. 4,323,421. This application Jul. 31, 1981, Ser. No. 288,689

Int. Cl.³ B32B *3/10*; H05K *1/00*

U.S. Cl. 428—195 **4 Claims**

1. A molded composite, upon which a circuit of conductive material is defined, formed from a composition comprising: resin, 60–80 parts by weight; cross-linking monomer which forms a three dimensional network with the polymeric portion of the resin formulation, 0.5–60 parts by weight; low profile additive, 15–40 parts by weight; catalyst, 0.5–3 parts by weight; filler, 100–200 parts by weight; viscosity control agent,

0–5 parts by weight; and reinforcement, 20–250 parts by weight.

4,393,112

TRANSFER POWDER MARKING METHOD USING A CORE-SHELL POWDER COMPRISING A PIGMENT, SOLVENT-INSOLUBLE POLYESTER RESIN AND A VOLATILE HALOGENATED HYDROCARBON INSOLUBLE INGREDIENT

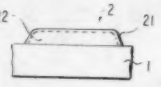
Satoru Honjo, Asaka; Yasuaki Yuyama; Masakazu Iwasa, both of Odawara, and Kazuo Imanishi, Saga, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 46,278, Jun. 7, 1979, abandoned. This application May 20, 1981, Ser. No. 265,317

Claims priority, application Japan, Jun. 7, 1978, 53-68639

Int. Cl.³ B32B *5/16, 27/00*

U.S. Cl. 428—207 **22 Claims**



1. In a marking process which comprises transfer of a pattern of a powder of a marking agent across a wide air gap between a metal member to be marked in a marking pattern and an image-holding member and solvent-fixing said powder, the improvement wherein said powder has a particle diameter of about 20 to 200 μm and comprises a pigment, a fixing solvent-soluble polyester resin, and from 15 to 70% by volume of the marking agent of a volatile halogenated hydrocarbon-insoluble ingredient, wherein said powder comprises a core and a shell portion wherein said core consists of said volatile halogenated hydrocarbon-insoluble ingredient.

4,393,113

NOVEL SILICON-CONTAINING COPOLYMER, ULTRATHIN SOLID MEMBRANE COMPOSED OF SAID COPOLYMER, USE OF SAID SOLID MEMBRANE FOR CONCENTRATING A SPECIFIED GAS IN A GASEOUS MIXTURE, AND PROCESS FOR PRODUCING SAID SOLID MEMBRANE

Kiyoshi Sugie; Takeyoshi Yamada, and Teizo Yamaji, all of Iwakuni, Japan, assignors to Teitin Limited, Osaka, Japan

Filed Jun. 3, 1981, Ser. No. 270,128

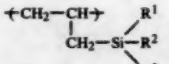
Claims priority, application Japan, Jun. 5, 1980, 55-74860; Apr. 20, 1981, 56-58443

Int. Cl.³ B01D *13/00;* **C08F** *230/08*

U.S. Cl. 428—220 **13 Claims**

1. An ultrathin solid membrane capable of producing a concentrated gas from a mixture of two or more gases, especially for obtaining an oxygen-enriched gas from a gaseous mixture containing oxygen gas, said solid membrane having a thickness of from about 50 to about 3,000 A and being composed substantially of a film-forming silicon-containing copolymer consisting substantially of

(a) at least one recurring unit of the following formula



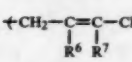
(I)

wherein R^1, R^2 and R^3 are identical or different, and each represents an alkyl group having 1 to 10 carbon atoms, or a phenyl group which may be substituted by an alkyl group having 1 to 4 carbon atoms, and

(b) at least one additional recurring unit selected from recurring units of the formula (II-1) and (II-2):

(II-1)

wherein R^4 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, and R^5 represents a hydrogen atom, an alkyl or alkenyl group having 1 to 20 carbon atoms, or a phenyl group which may be substituted by an alkyl group having 1 to 4 carbon atoms; and



(II-2)

wherein R^6 and R^7 are identical or different, and each represents a hydrogen atom, a chlorine atom, or a methyl group,

the proportion of said recurring unit of formula (I) being about 5 to about 95 mole% based on the total recurring units of the silicon-containing copolymer and said silicon-containing copolymer having an inherent viscosity, measured at 25° C. for a solution of 0.5 g of the copolymer in 100 cc of cyclohexane, of about 0.5 to about 4.0.

11. The solid membrane of claim 1 which is carried on a porous sheet-like material.

12. A composite film membrane comprising a porous sheet-like material supporting thereon a laminate of the ultrathin solid membrane of claim 1 and another solid membrane able to separate gases, said laminate having a total thickness in the range of about 50 to about 5,000 Å.

4,393,114

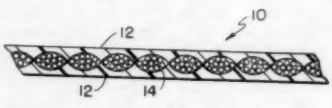
MEAT PACKAGING MATERIAL

Ralph Gillespie, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 9, 1982, Ser. No. 448,307

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—252 **3 Claims**



1. A fabric particularly useful as a wrapping for foodstuffs, such as meat comprising: a layer of warp knit, weft inserted, synthetic fabric and a layer of wax coated to both sides of said layer.

4,393,115

MULTILAYERED POLYPROPYLENE FILM

Toshiya Yoshii, Ohtsu; Satoru Nakura, Kusatsu, and Masatsugi Murakami, Moriyama, all of Japan, assignors to Toray Industries, Tokyo

Filed Jul. 15, 1981, Ser. No. 283,380

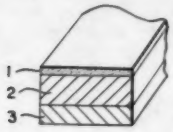
Claims priority, application Japan, Jul. 22, 1980, 55-100228

Int. Cl.³ B32B *5/16, 27/32*

U.S. Cl. 428—323 **20 Claims**

1. A multilayered polypropylene film capable of being readily cut by hand and having a surface which is capable of accepting writing or drawing thereon, which comprises a biaxially oriented polypropylene layer and a polypropylene

layer uniaxially oriented in the direction of its width, and laminated upon at least one surface of said laminated film a propylene-ethylene block copolymer layer stretched uniaxially or biaxially.



4,393,116

SHAPED MATERIALS

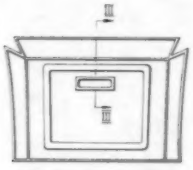
Derek P. Taylor, Essington, near Wolverhampton, England, assignor to Fasthac Research Limited, West Midlands, United Kingdom

Filed Jul. 18, 1980, Ser. No. 170,236

Claims priority, application United Kingdom, Jul. 24, 1979, 7925655

Int. Cl.³ C09J *7/02, 5/02*

U.S. Cl. 428—343 **22 Claims**



1. A soft permeable material having on at least one face thereof a coating of a substance having latent adhesive capacity to form a treated material, said substance containing a pre-polymer and which under normal conditions is stable but is activated by heat alone at a temperature above about 80° C. to undergo a chemical reaction and act as an adhesive forming a strong permanent bond, whereby said treated material may be shaped by applying mechanical compressive force so as to impart the desired shape thereto under the application of said heat such that the latent adhesive substance is activated and cured to the extent necessary to hold said treated material in the desired shape, wherein said treated material can be stored for several months, and wherein the substance is substantially non-tacky prior to being activated but is irreversibly converted to a strong adhesive after activation and curing.

4,393,117

HOT MELT TRANSFER COATING PROCESS AND PRODUCTS

George O. Stricker, Midlothian; Karl H. Teumer, Chicago, and Ronald C. Groenendal, Oak Forest, all of Ill., assignors to Ludlow Corporation, Chicago, Ill.

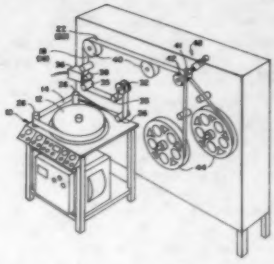
Filed Jul. 13, 1981, Ser. No. 282,581

Int. Cl.³ C09J *7/04;* **B05D** *3/12, 5/10*

U.S. Cl. 428—352 **9 Claims**

1. In a process for placing a releasable pressure-sensitive adhesive coating on an unspooled web which is being unwound from a supply spool and which comprises a first side having a first release coating having relatively high peel strength with respect to said adhesive coating, and a second side having a second release coating having relatively low peel strength affinity with respect to said adhesive coating, and thereupon spooling the resulting adhesive-coated web onto a packaging spool so that the surface of the adhesive coating contacts the second side of said substrate;

the improvement wherein said adhesive coating is applied as a substantially solvent-free hot-melt coating, said adhesive coating is caused to solidify by positive cooling applied to the unspooled web, wherein said cooling is controlled so



that moisture condensation on the web is substantially avoided, and wherein the entire supply spool-to-packaging spool travel time of said web is a period of about 0.5 to 5 seconds.

4,393,118

METHOD OF PREPARING A DARK BODY PHOSPHOR

Harry L. Marshall, and Alan R. Schwartz, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 18, 1981, Ser. No. 322,330

Int. Cl.³ B05D *5/06, 5/12*

U.S. Cl. 428—403 **8 Claims**

1. A method of making pigmented phosphor comprising the steps of: preparing an aqueous suspension of phosphor particles and finely powdered carbon; adding colloidal silica to the suspension; agitating the suspension; removing the liquid and drying the phosphor particles.

4,393,119

ARTICLE COATED WITH AQUEOUS DISPERSION OF FLUOROPOLYMERS IN COMBINATION WITH EPOXY-TYPE FILM FORMERS

Thomas P. Concannon, Newtown Square, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 279,162, Jun. 30, 1981, Pat. No. 4,335,030. This application Feb. 16, 1982, Ser. No. 349,304

Int. Cl.³ B32B *27/38*

U.S. Cl. 428—413 **30 Claims**

1. An article coated with a cured coating of an aqueous coating composition having a dispersed phase which consists essentially of:

(A) 90 to 10% by weight, based on the weight of (A) plus (B), of the reaction product of:

(1) at least 50%, based on the weight of (1) plus (2), of an epoxy resin containing, on the average, two terminal 1,2-epoxy groups per molecule and having an epoxy equivalent weight of 750–5000;

(2) a carboxyl-functional polymer in an amount sufficient to provide at least 2.50 equivalents of carboxyl groups, when the source of the carboxyl group is a mono-protic acid, and at least 4.0 equivalents of carboxyl groups, when the source of such groups is a diprotic acid, per equivalent of 1,2-epoxy groups in the epoxy resin, said polymer having a weight average molecular weight (determined by light scattering) of about 10,000–160,000 and an acid number of 200–500;

(3) an aqueous solution of at least 1.50 equivalents of a tertiary amine per equivalent of 1,2-epoxy groups in the

epoxy resin, said tertiary amine being selected from the group consisting of $R_1R_2R_3N$, pyridine, N-methylpyrrole, N-methyl piperidine, N-methyl pyrrolidine, N-methyl morpholine, and mixtures thereof and wherein R_1 and R_2 are substituted or unsubstituted monovalent alkyl groups containing one or two carbon atoms in the alkyl portion and R_3 is a substituted or unsubstituted monovalent alkyl group containing 1–4 carbon atoms; and

(4) 10–90% of the amount required for stoichiometric reaction with the carboxyl-functional polymer of (2), of at least one primary, secondary or tertiary amine or monofunctional quaternary ammonium hydroxide, such that the pH of the reaction product of (A) is greater than 8.5;

Y being at least about $6+0.75\ (2^x)$, where Y is the milliequivalent of carboxyl groups neutralized by primary, secondary or tertiary amine or monofunctional quaternary ammonium hydroxide per 100 grams of acid polymer plus epoxy, and X is the epoxy equivalent weight divided by 1000;

and wherein for increasing ratios of carboxyl groups to 1,2-epoxy groups, the amount of amine is increased to keep the carboxyl-functional polymer water dispersible;

(B) 10–90% by weight, based on the weight of (A) plus (B), of a fluorocarbon polymer; and

(C) optionally, up to 20% by weight, based on the weight of (A), of a nitrogen or phenolic crosslinking agent.

4,393,120

PLASTIC COATED WITH GOLDEN EVAPORATED FILM

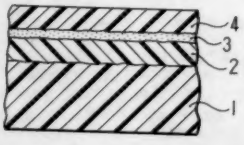
Haruhisa Watai, Kariya; Hiroyuki Furuta, Kounan, and Akira Kawamoto, Nagoya, all of Japan, assignors to Yuken Industry Co., Ltd., Kariya, Japan

Filed Aug. 18, 1981, Ser. No. 294,030

Claims priority, application Japan, Sep. 26, 1980, 55-134739; Jan. 27, 1981, 56-10510

Int. Cl.³ B32B *27/08, 33/00*

U.S. Cl. 428—457 **4 Claims**



1. In a plastic article coated with a golden color evaporated metal film and comprising a plastic substrate, a primary coating layer provided on said substrate, a golden color evaporated metal film provided on said primary coating layer and an outer coating layer provided on said golden color evaporated metal film, the improvement wherein said golden color evaporated metal film is a Cu-Sn-Al alloy composed of 5–15 wt.% Al, 3–20 wt.% Sn, less than 6 wt.% impurities and the balance 75–90 wt.% Cu.

4,393,121

POLYESTER COIL COATING

Michael A. Tobias, Bridgewater, and Conrad L. Lynch, Metuchen, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,518

Int. Cl.³ B32B *15/08*; C08G *63/16*; C08L *67/02*

U.S. Cl. 428—458 **8 Claims**

1. A linear thermosettable polyester resin based upon 10–20 weight percent cyclohexanedimethanol, 10–16 weight percent adipic acid, 12–16 weight percent neopentyl glycol, 12–16 weight percent propylene glycol or butanediol, and 40–48 weight percent isophthalic acid component.

3. A coating composition comprising

(A) a linear thermosettable polyester resin based upon 10–20 weight percent cyclohexanedimethanol, 10–16 weight percent adipic acid, 12–16 weight percent neopentyl glycol, 12–16 weight percent propylene glycol or butanediol, and 40–48 weight percent isophthalic acid component,

(B) between about 10 weight percent and about 20 weight percent on resin solids of an aminoplast,

(C) between about 0.1 and about 1 weight percent on resin solids of an acid catalyst, and

(D) an inert organic solvent in an amount sufficient to provide a solids content of between about 50 weight percent and about 75 weight percent.

4,393,122

CLAD STEEL PLATES

Akira Takayasu, 5-1 Horita-dor, Mizuho-ku, Nagoya-shi, Aichi 467, Japan

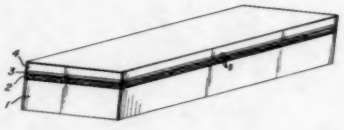
PCT No. PCT/JP80/00044, § 371 Date Dec. 18, 1980, § 102(e) Date Dec. 8, 1980, PCT Pub. No. WO80/02246, PCT Pub. Date Oct. 30, 1980

PCT Filed Mar. 14, 1980, Ser. No. 224,537

Claims priority, application Japan, Apr. 18, 1979, 54-52585[U]

Int. Cl.³ B32B *3/30*

U.S. Cl. 428—594 **1 Claim**



1. A clad steel plate produced by sandwiching a thin copper sheet and a stainless steel net between a steel plate and an anticorrosive metal plate and locally bonding them to each other by welding.

4,393,123

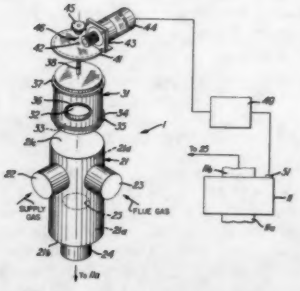
FUEL CELL TEMPERATURE CONTROL ASSEMBLY

Matthew A. Lambrech, Sherman, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Feb. 1, 1982, Ser. No. 344,374

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—24 **15 Claims**



1. An assembly for use in controlling the temperature of a fuel cell having input and output ports for receiving supply gas and discharging exhaust gas, said assembly comprising:

an outer valve member including first, second, and third

ports, said first and second ports being spaced and adapted to receive supply gas at first and second temperatures, respectively, said first temperature being higher than said second temperature, said third port being displaced from said first and second ports and being adapted to connect to said input port of said fuel cell;

an inner valve cylinder having an input coupling port and an output coupling port, said inner valve member being movably mounted in said outer valve member such that said input coupling port in the position of said first and second ports overlaps said first and second ports, respectively, and such that said output coupling port communicates with said third port;

and means for sealing said first and second ports from said third port such that coupling between said first and second ports and said third port occurs only through said input and output coupling ports.

4,393,124

SOLID ELECTROLYTES STRENGTHENED BY METAL DISPERSIONS

Robert J. Lauf, and Chester S. Morgan, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 5, 1981, Ser. No. 308,739
Int. Cl.³ H01M *4/36*
U.S. Cl. 429—104 **7 Claims**

1. In a secondary battery, a solid electrolyte comprising:

an ion-conductive sodium beta-alumina ceramic material; and

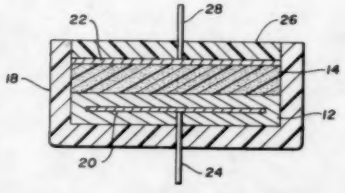
a discontinuous metal phase dispersed throughout said ceramic material and selected from the group consisting of Pt, Cr, Fe, Co, Ni, Nb and alloys and mixtures thereof.

4,393,125

BATTERY CATHODES

Paul M. Skarstad, Wayzata; Arthur J. Coury, St. Paul, and Darrel F. Untereker, Cedar, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 21, 1980, Ser. No. 142,662
Int. Cl.³ H01M *10/40*
U.S. Cl. 429—105 **1 Claim**



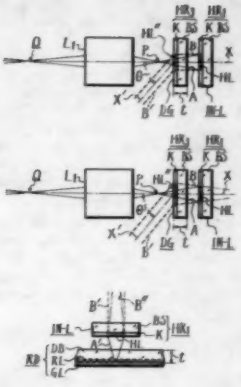
1. An iodine cathode for batteries, the cathode comprising a liquid/solid composition, the liquid portion being saturated with dissolved iodine and including an organic donor complexed with at least part of the iodine and further including an additional component of styrene copolymerized with a vinylpyridine donor, the solid portion of the cathode consisting essentially of iodine.

4,393,126

METHOD FOR MANUFACTURING IN-LINE HOLOGRAM LENS

Chiaki Kojima, Yokohama; Kayoko Hasegawa, Kamakura, and Kosuke Miyahara, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,728
Claims priority, application Japan, May 14, 1980, 55-63795
Int. Cl.³ G03C *5/00*; G02B *5/32*
U.S. Cl. 430—2 **5 Claims**



1. A method of producing an inline hologram lens, comprising the steps of:

producing a coherent diffracted wave beam by diffraction means;

producing a coherent spherical wave beam by objective lens means separate from said diffraction means;

providing said diffracted wave beam perpendicularly incident on a photo-sensitive layer as a reference wave beam;

simultaneously providing said spherical wave beam perpendicularly incident on said photo-sensitive layer as a subject wave beam through said diffraction means; and

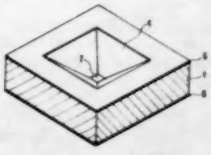
developing said photo-sensitive layer to produce said inline hologram lens.

4,393,127

STRUCTURE WITH A SILICON BODY HAVING THROUGH OPENINGS

Johann Greschner, Pliezhausen; Georg Kraus, Wildberg, and Gerhard E. Schmid, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,268
Claims priority, application European Pat. Off., Sep. 19, 1980, 80105618.5
Int. Cl.³ H01L *21/306*
U.S. Cl. 430—5 **13 Claims**



1. A structure for modifying energetic radiation comprising a silicon body having a through hole defining a passage for said

energetic radiation; and a layer of heavy metal silicide covering the surface of said silicon body, whereby said metal silicide layer maintains good adherence to said silicon body under thermal stress, and said metal silicide layer absorbs said energetic radiation except in said defined passage by way of said through hole.

4,393,128

LIGHT-SENSITIVE LITHOGRAPHIC PRINTING PLATE PRECURSOR

Keisuke Shiba; Sho Nakao, and Tadao Toyama, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 4, 1981, Ser. No. 299,421
Claims priority, application Japan, Sep. 8, 1980, 55-124358
Int. Cl.³ G03C *1/76*
U.S. Cl. 430—273 **11 Claims**

1. A light-sensitive lithographic printing plate precursor comprising an aluminum support having an aluminum oxide film on the surface thereof and having formed thereon a silver halide-containing light-sensitive layer, wherein the mean weight of said aluminum oxide film is at least 1 g/m^2, and at least one layer on said support contains a heterocyclic mercapto compound and the total amount of said compound is at least 1 millimol per mol of silver halide sufficient to prevent the formation of spots during the process of making a printing plate from said light sensitive lithographic printing plate precursor.

4,393,129

METHOD OF STRESS-FREE DEVELOPMENT OF IRRADIATED POLYMETHYLMETACRYLATE

Walter Glashauser, Munich, and Grigore-Vlad Ghica, Ebenhausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich

Filed Sep. 17, 1981, Ser. No. 303,094
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039110
Int. Cl.³ G03C *5/30*
U.S. Cl. 430—296 **5 Claims**

1. A method of generating stress-free structures in x-ray sensitive or electron beam-sensitive resist layers or films comprising polymethylmethacrylate material so as to achieve a very high aspect ratio after proper irradiation; comprising

irradiating a select pattern of x-rays or electron beams onto a relatively thick resist layer comprising said polymethylmethacrylate material; and

developing said exposed resist layer with a developer composed of a mixture of a material selected from the glycol ether group, a material selected from the primary amine group, a material selected from the aqueous group, and a material selected from the azine group.

4,393,130

SYSTEM FOR ENCAPSULATION OF SEMICONDUCTOR CHIPS

Nelson Ho, West Valley, and Jiri Kratochvil, Sandy, both of Utah, assignors to Critikon, Inc., Tampa, Fla.

Filed Jan. 11, 1982, Ser. No. 338,732
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—313 **5 Claims**

1. A method of encapsulating at least a portion of a semiconductor wafer having a plurality of regions which are to be exposed through the encapsulant, said method comprising the steps of

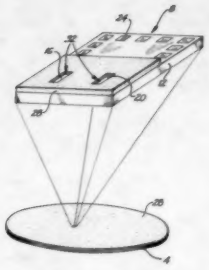
laminating one or more sheets of dry film photoresist material onto a surface of the wafer,

aligning a photomask with the wafer so that a predetermined light-transmitting pattern of the mask coincides with certain areas of the wafer surface,

directing light onto the photomask and through the light-transmitting pattern of the mask onto the wafer, and

developing the photoresist material to remove the material from over said regions of the wafer to define windows in the material through which the regions are exposed,

wherein the semiconductor wafer includes a plurality of field-effect transistor devices, each of which includes a gate region corresponding to a different one of the regions



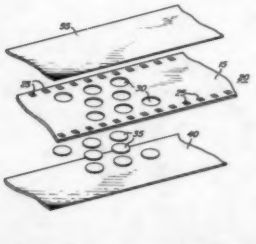
to be exposed through the encapsulant, said method further comprising the step of applying a chemical sensitive membrane system into each of the windows defined in the photoresist material to adhere to the sides of the windows and cover the corresponding exposed regions.

4,393,131

METHOD FOR CAPTIVATING A SUBSTRATE WITHIN A HOLDER

Jeffery A. Whalin, Miami Lakes; Charles W. Shanley, Plantation; Michael N. Scansaroli, Pembroke Pines, all of Fla., and Lawrence N. Dworsky, Northbrook, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1982, Ser. No. 362,938
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—320 **24 Claims**



1. A method of captivating a substrate within a holder for photolithographic processing comprising the steps of:

placing a substrate having two opposed major surfaces within a holder, said holder having two opposed major surfaces and at least one aperture appropriately dimensioned for accepting said substrate;

laminating a dry film photopolymer resist to at least one surface of said holder and said substrate, thereby captivating said substrate within the aperture of said holder;

polymerizing said resist in desired areas including at least one uninterrupted area extending from one surface of said holder to a corresponding surface of said substrate;

removing resist in the undesired areas, thereby leaving a retaining tab of resist in at least one uninterrupted area extending from one surface of said holder to one surface of said substrate.

19. A substrate processed in accordance with the method of claim 1.

4,393,132

PHOTOGRAPHIC RECORDING MATERIAL WITH ARYLAZOCYANOACETIC ESTER DYE RELEASERS

Günther Schenk; Peter Bergthaller, both of Cologne; Gerhard Wolfrum, Leverkusen, and Rudolf Stolzenburg, Duesseldorf, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

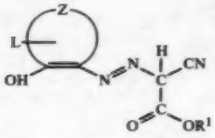
Filed Apr. 23, 1982, Ser. No. 371,076

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117243

Int. Cl.³ G03C 5/54, 7/00, 1/10, 1/40

U.S. Cl. 430—562 2 Claims

1. In a color photographic recording material for the production of colored images by the dye diffusion transfer process, comprising at least one photosensitive silver halide emulsion layer and associated thereto a nondiffusing color-providing compound, capable of releasing under the conditions of alkaline development and as a function of the development of the silver halide emulsion layer, a diffusible azo dye which can complex with metal ions, the improvement according to which the released azo dye in one of its tautomeric forms corresponds to the following general formula II



(II)

wherein

R^1 represents alkyl, alkenyl or cycloalkyl having up to 8 carbon atoms,

Z represents a radical required for completing a benzene or naphthalene ring; and

L represents a substituent having a group which results from the splitting from a carrier radical.

4,393,133

HUMAN HEPATOMA DERIVED CELL LINE, PROCESS FOR PREPARATION THEREOF, AND USES THEREFOR

Barbara B. Knowles, West Chester, and David P. Aden, Philadelphia, both of Pa., assignors to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Filed Jun. 12, 1980, Ser. No. 158,685

Int. Cl.³ C12N 7/00, 7/02, 5/00; C12P 21/00; C12Q 1/68

U.S. Cl. 435—6 9 Claims

1. A process for assessing the metabolic conversion of chemicals and drugs considered to be potential carcinogens and mutagens, which comprises:

(a) maintaining a culture of a human hepatic cell line selected from the group consisting of the cell lines designated Hep 3B and Hep G2 in a nutrient medium,

(b) exposing said cell line to the chemical or drug to be tested,

(c) analyzing said culture for the presence of metabolites of said chemical or drug, and

(d) introducing said metabolites to cultures of other mammalian cells to determine their mutagenic capabilities.

4. A process for isolation of hepatitis B virus surface antigen for use as a vaccine which comprises:

(a) maintaining a human hepatic cell line, designated Hep 3B, which contains the hepatitis B virus genome in nutrient culture medium,

(b) recovering the supernatant fluid from said culture, and

(c) purifying the hepatitis B virus surface antigen in said supernatant fluid for use as a vaccine.

4,393,134

STANDARD BLOOD FILTER PAPER FOR USE IN DIAGNOSIS OF HISTIDINEMIA

Akira Yano, Tokorozawa; Yoshitada Saito, Oomiya, and Yasushi Kasahara, Tama, all of Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,096

Claims priority, application Japan, Oct. 7, 1981, 56-158629

Int. Cl.³ C12Q 1/00; G01N 33/68

U.S. Cl. 435—29 7 Claims

1. A standard blood filter paper for measuring the concentration of histidine in the blood, comprising:

a piece of filter paper, and

a blood material, infiltrated in said filter paper, containing a known concentration of histidine and at least one salt selected from the group consisting of a dithionite, a disulfite and a bisulfite in an amount effective to preserve said histidine.

4,393,135

METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Takayasu Tsuchida, Kawasaki, and Shigeru Nakamori, Yokohama, both of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Dec. 2, 1980, Ser. No. 212,245

Claims priority, application Japan, Dec. 10, 1979, 54-160117; Feb. 23, 1980, 55-22062

Int. Cl.³ C12N 1/20, 15/00; C12P 13/14; C12R 1/185

U.S. Cl. 435—110 16 Claims

1. A method of producing L-glutamic acid by fermentation which comprises culturing in a culture medium an L-glutamic acid producing microorganism which is obtained by incorporating a hybrid plasmid having inserted therein a DNA fragment with genetic information controlling L-glutamic acid production, said fragment being derived from a donor strain of the genus Escherichia which is capable of producing L-glutamic acid, into a recipient strain of the genus Escherichia, wherein said L-glutamic acid producing microorganism is the transformant NRRL B-12286, NRRL B-12299, NRRL B-12300, NRRL B-12301, or NRRL B-12302.

4,393,136

BACTERIAL ETHANOL PRODUCTION

Peter S. J. Cheetham, Reading, England, assignor to Talres Development (N.A.) N.V., Netherlands Antilles

Filed Jul. 7, 1981, Ser. No. 281,293

Claims priority, application United Kingdom, Jul. 8, 1980, 8022243

Int. Cl.³ C12D 7/06

U.S. Cl. 435—161 16 Claims

1. A process for producing ethanol, wherein a carbohydrate is converted by immobilized cells of an ethanol-producing bacterium into ethanol, said carbohydrate being presented to said cells in a medium which is nutritionally inadequate for growth of said cells by lacking at least one factor required therefor.

4,393,137

CLONING PLASMID FOR STREPTOMYCES

Jack J. Manis, Portage, and Sarah K. Highlander, Oshtemo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

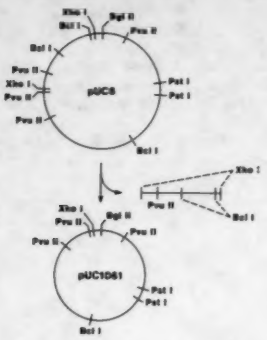
Filed Jun. 22, 1981, Ser. No. 276,425

Int. Cl.³ C12N 15/00, 1/20, 1/00; C12R 1/465

U.S. Cl. 435—172 5 Claims

4. A process for cloning plasmid pUC1061 into a suitable host of the genus Streptomyces which comprises:

(a) digestion of pUC6 DNA with restriction endonuclease XhoI to obtain fragmented linear plasmid DNA;



(b) ligating the largest fragment of said plasmid DNA to obtain plasmid pUC1061; and,

(c) transforming said plasmid into said suitable host.

4,393,138

METHOD FOR DISINFECTING IMMOBILIZED ENZYMES

Jean-Luc A. G. Baret, Moret, France, assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 12, 1980, Ser. No. 206,099

Claims priority, application France, Dec. 12, 1979, 79 30598

Int. Cl.³ C12N *11/14, 11/00, 9/38, 9/92*

U.S. Cl. 435—176 **4 Claims**

1. A method for disinfecting immobilized enzymes which comprises contacting the immobilized enzymes with a dilute aqueous solution of at least one substituted diethylenetriamine at a concentration and for a period of time which is sufficient to substantially kill the contaminating microorganisms without significant deleterious effects on the immobilized enzymes, in which the enzymes are selected from the group consisting of lactase and glucose isomerase, the enzymes are immobilized on an inorganic support, and the substituted diethylenetriamine is selected from the group consisting of dioctyldiethylenetriamine and a mixture of dioctyldiethylenetriamine and trioctyldiethylenetriamine.

4,393,139

PROCESS FOR THE SELECTIVE SEPARATION OF ENDOPROTEASES

Jürgen Schrenk, Weilheim, and Peter Wunderwald, Haunshofen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,467

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034043

Int. Cl.³ C12N *9/50, 9/48, 9/60*

U.S. Cl. 435—219 **5 Claims**

1. Process for the selective separation of endoproteases from aqueous solutions, which process comprises treating an aqueous solution containing proteases with a complex, present in the solid phase, of alpha$_2$-macroglobulin with a divalent metal selected from zinc, cobalt, nickel and copper, and then separating off the solid phase containing endoprotease inhibited by alpha$_2$-macroglobulin.

4,393,140

PROCESS FOR THE PREPARATION OF THE HIGHLY PURE ENZYME KALLIKREIN FROM SWINE PANCREAS EXTRACTS

Hermann Schutt, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 12, 1982, Ser. No. 339,017

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103257

Int. Cl.³ C12N *9/64*

U.S. Cl. 435—226 **5 Claims**

1. A process for the preparation of pure kallikrein, which comprises adjusting an organ extract containing kallikrein to a conductivity of 2 to 6 mS cm^{-1} at a pH value of 5 to 8, bringing the organ extract thus prepared into contact with an ion exchanger in batch form or column form, eluting the kallikrein by continuously or discontinuously increasing the ionic strength by means of a mono- or divalent alkali metal salt or alkaline earth metal salt or by lowering the pH value and subsequently purifying the eluate by affinity chromatography on BPTI covalently bonded to a carrier and then desorbing from the BPTI-carrier at a pH value of 4.0 to 5.0.

4,393,141

METHOD AND DEVICE FOR EXAMINING URINE FOR PARTICULATE CONSTITUENTS

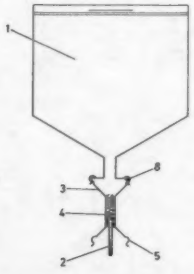
Gert Schlueter, Liederbach, and Wilhelm Schuster, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,070

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108133

Int. Cl.³ G01N *33/48, 31/06*

U.S. Cl. 436—63 **7 Claims**



4. Device for carrying out the method of examining urine for particulate constituents, the device consists essentially of (a) a urine collector, and (b) a detachable filter cartridge, which is affixed to said collector, said filter cartridge containing, as filter material, synthetic fibers that are soluble in alcohol or in aqueous alcohol, after the urine has passed through the filter, and after the collector has been removed, a liquid-tight connection is establishable between one opening of the filter cartridge and a storage vessel and the other opening is closable in a liquid-tight manner.

4,393,142

ASSAY METHOD AND REAGENT FOR THE DETERMINATION OF CHLORIDE

Thomas W. Stephens, Indianapolis, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed Feb. 1, 1982, Ser. No. 344,331

Int. Cl.³ G01N *33/52, 33/84*

U.S. Cl. 436—125 **8 Claims**

4. A method for the determination of chloride in a protein-containing fluid, comprising the steps of:

(a) combining a sample of said fluid with a reagent to form a solution, said reagent comprising:
(i) 2,4,6-tripyridyl-s-triazine,
(ii) mercuric ions,
(iii) ferrous ions,
(iv) at least one salt selected from the group consisting of sodium sulfate, manganese sulfate, magnesium sulfate, and cupric sulfate; and
(v) a buffer selected from the group consisting of sulfuric acid and toluene sulfonate;
(b) measuring the absorbance of said solution; and
(c) comparing the absorbance of said solution with the absorbance obtained on solutions containing known amounts of chloride.

4,393,143

AMORPHOUS REFRACTORY SETTABLE AT LOW TEMPERATURES

Satoru Yoshinaka, Okayama; Masao Fushida, Bizen, and Tatsuzi Kimoto, Okayama, all of Japan, assignors to Tsurumi Synthetic Refractories Co., Ltd., Japan

Filed May 22, 1981, Ser. No. 266,299
Int. Cl.³ C04B 35/52
U.S. Cl. 501—89 5 Claims

1. An amorphous refractory which is settable at low temperatures consisting essentially of a dry mixture of refractory material, silicon powder in an amount of 0.5 to 5% by weight based on the whole amount of the refractory and serving as a sintering agent, and a phosphate glass powder in an amount of 0.5 to 3% by weight based on the whole amount of the refractory and serving as a sintering and setting agent, the refractory being usable in the form of a powder.

4,393,144

METHOD FOR PRODUCING METHANOL

Masaru Ichikawa, Yamato, Japan, assignor to Sagami Chemical Research Center, Tokyo, Japan

Continuation of Ser. No. 77,223, Sep. 29, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,168
Claims priority, application Japan, Sep. 20, 1978, 53-114538
Int. Cl.³ C07C 27/06, 29/15, 31/04
U.S. Cl. 518—715 3 Claims

1. A method for producing methanol which comprises reacting a gas containing a carbon oxide and hydrogen in the presence of a catalyst consisting essentially of palladium supported on at least one oxide of metal selected from the group consisting of yttrium oxide, lanthanum oxide and neodymium oxide.

4,393,145

ANIONIC ION EXCHANGE RESINS WITH CHOLESTEROL-DECREASING PROPERTIES

Hans N. Zemp, Lugano, Switzerland, assignor to Etablissement Texcontor, Vaduz, Liechtenstein

Continuation of Ser. No. 35,091, May 1, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 294,146
Int. Cl.³ B01J 41/12
U.S. Cl. 521—38 14 Claims

1. An anionic ion exchange resin prepared from monomers of the group consisting of non-toxic styrene, acrylic or epoxy compounds, cross-linked through divinylbenzene and containing methylamino and methylammonium groups, which resin has strong cholesterol-decreasing properties, an apparent density in water of 0.18 to 0.20 g of dry material/ml and a water absorption capacity of 69 to 73% by weight of the polymer weight wherein the amount of cross-linking agent when the monomer is styrene is not substantially less than 1.5% by weight and not substantially more than 2.5% by weight, when the monomer is an acrylic is not substantially less than 10% by weight and not substantially more than 12% by weight and when the monomer is an epoxy is not substantially less than 3% by weight and not substantially more than 4% by weight, said weight ratios being calculated on the combined weight of the monomer and of the cross-linking agent.

4,393,146

FIRE RETARDANT FINE PARTICULATE EXPANDABLE STYRENE POLYMERS

Josef K. Rigler, Recklinghausen; Ekkehard Wienhöfer, Marl; Horst Leithäuser, Marl, and Karl Trukenbrod, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,070
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122342
Int. Cl.³ C08J 9/20, 9/22
U.S. Cl. 521—56 6 Claims

1. In a process for the preparation of shaped bodies based on expanded styrene or a mixture thereof with at least one monomer copolymerizable therewith, the addition of an expanding agent and a five retardant organic halogen compound, preforming of the resulting expandable particles, ageing of the formed particles, and molding thereof in a pressure resistant mold, the improvement comprising: carrying out the polymerization in the presence of about 0.0001 to 0.1 percent by weight based on the weight of said styrene or mixture thereof of esters of aliphatic dicarboxylic acids and aliphatic epoxy alcohols, said esters having at least 11 carbon atoms and said esters soluble in said monomers and comonomers.

4,393,147

EXPANDABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Nov. 22, 1982, Ser. No. 443,309
Int. Cl.³ C08J 9/18
U.S. Cl. 521—60 6 Claims

1. An expandable polymeric styrene particle having incorporated therein a blowing agent and a from about 0.1% to about 1.0% of ethylene-bis-stearamide and a from about 1% to about 1.5% of dibromoethyldibromocyclohexane, all percentages being based upon the weight of the polymeric styrene.

4,393,148

REACTION OF T-ALKYLHYDRAZINIUM SALTS AND OGRANIC PEROXIDES TO FOAM UNSATURATED POLYESTER RESINS

Ernest R. Kamens, Tonawanda, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 30, 1982, Ser. No. 431,545
Int. Cl.³ C08J 9/10
U.S. Cl. 521—93 11 Claims

1. A foamable and curable composition comprising an admixture of an unsaturated polyester and a polymerizable unsaturated monomer or polymethylmethacrylate and a polymerizable unsaturated monomer, a peroxide, at least one transition metal salt promoter where at least one of the metals is selected from group consisting of iron and copper, and a t-alkylhydrazinium salt blowing agent.

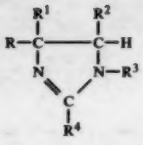
4,393,149

METHOD OF PREPARING POLYURETHANE FOAMS USING IMIDAZOLINES AS CATALYSTS

Paul E. Eckler, Terre Haute, Ind., assignor to Angus Chemical Company, Northbrook, Ill.

Filed Mar. 30, 1982, Ser. No. 363,719
Int. Cl.³ C08G 18/18
U.S. Cl. 521—129 4 Claims

1. A method of catalyzing the curing of polyurethane foams formed by reacting a polyol with a diisocyanate in the presence of a blowing agent and a catalyst comprising using as the catalyst a compound of the formula



where R can be hydrogen, methyl, ethyl or $R^4CO_2CH_2$—; R^1 can be hydrogen, methyl, ethyl or $R^4CO_2CH_2$—; R^2 can be hydrogen or an alkyl group of 1–3 carbon atoms; R^3 can be alkyl of 1–4 carbon atoms or phenyl, and R^4 can be hydrogen, alkyl or alkenyl of 1–17 carbon atoms.

4,393,150

ADHESIVE BANDAGE MATERIAL

Stanley Kresner, 100 Moree Loop, #19, Winter Springs, Fla. 32708

Filed May 7, 1982, Ser. No. 375,807
Int. Cl.³ C08K *3/10, 5/05*
U.S. Cl. 523—111 **4 Claims**

1. An adhesive bandage material adapted to be formed into sheet material and applied to a bandage cloth comprising:

a blend of 20–35% by weight of polyisobutylene and polybutene;

5–15% by weight of butyl rubber;

1–10% by weight of reinforcing fibers of aromatic polyamide fibers;

¼–4% by weight of zinc oxide;

talc filler material; and

ethyl alcohol to thereby form a viscous material capable of being formed in a sheet for attachment to bandage cloth.

4,393,151

STABLE SUSPENSIONS OF WATER-SOLUBLE POLYMERS AND THEIR MANUFACTURE

Francois Dawans, Bougival; Daniel Binet, Rueil Malmaison; Norbert Kohler, Le Chesnay, and Quang Dang Vu, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 15, 1981, Ser. No. 283,322
Claims priority, application France, Jul. 15, 1980, 80 15586
Int. Cl.³ C08J *3/08;* **C08K** *5/01, 5/09;* **C08L** *5/00*
U.S. Cl. 523—130 **22 Claims**

1. A stable anhydrous suspension of a water-soluble polymer, consisting essentially of solid particles of at least one water-soluble polymer suspended in (a) a liquid hydrocarbon medium, non-solvent for the water-soluble polymer, said liquid hydrocarbon medium comprising at least one aliphatic or aromatic hydrocarbon, the proportions being 40 to 150 parts by weight of said water-soluble polymer per 100 parts by weight of said liquid hydrocarbon medium, said stable anhydrous suspension further comprising per 100 parts by weight of said liquid hydrocarbon medium, from 0.1 to 5 parts by weight of (b) at least one thickening agent selected from the alkali or alkaline-earth metal salts of fatty acids having 6–33 carbon atoms.

21. In an enhanced oil recovery process comprising flooding an oil field by injecting an aqueous solution in an injection well so as to displace the oil from the underground rock formation into the production well, the improvement comprising adding to the aqueous solution the stable suspension of a water-soluble polymer as defined by claim **1**.

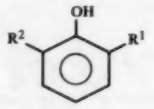
4,393,152

OXIDATIVELY COUPLED COLD-SET BINDERS

Charles E. Seeney, Brazil; John F. Kraemer, Terre Haute, both of Ind., and Nancy C. Varnum, Kingsville, Mo., assignors to International Minerals & Chemicals Corp., Terre Haute, Ind.

Filed Jul. 16, 1981, Ser. No. 283,718
Int. Cl.³ C08L *71/00*
U.S. Cl. 523—139 **16 Claims**

1. A foundry composition adaptable to forming cores and molds comprising a foundry aggregate, a binder therefor polymerizable by contact with oxygen, an amine and a metal salt catalyst, the binder being a disubstituted phenol represented by the formula



where R^1 and R^2 can be lower alkyl, methoxy, halide or phenyl.

4,393,153

IMPACT MODIFIED GLASS/MINERAL REINFORCED POLYESTER BLENDS

Leonard R. Hepp, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 30, 1981, Ser. No. 316,947
Int. Cl.³ C08L *25/10, 67/02*
U.S. Cl. 523—201 **10 Claims**

1. In a thermoplastic composition comprising

(a) a polyester composition comprising:

(i) a major proportion of a poly(1,4-butylene terephthalate)resin or a copolyester thereof with a minor amount of an aliphatic or aromatic dicarboxylic acid or an aliphatic polyol and

(ii) a minor proportion of a poly(ethylene terephthalate resin);

(b) an impact improving amount of a core-shell resin having a rubbery core surrounded by a grafted acrylic shell; and

(c) an effective reinforcing amount of a combination comprising approximately equal weights of mica and glass fibers, the improvement which comprises providing not substantially less than about 2.6 and not substantially more than about 4 parts by weight of poly(1,4-butylene terephthalate) resin component (a) (i) per 1 part by weight of said impact improving acrylic resin component (b).

4,393,154

CURABLE LONG FIBER LOADED RUBBER COMPOSITION AND METHOD OF MAKING SAME

Keith A. Tyler, and Sidney R. Fix, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 30, 1981, Ser. No. 288,702
Int. Cl.³ C08F *36/02;* **C08L** *21/00*
U.S. Cl. 524—12 **4 Claims**

1. An improved curable chopped fiber loaded rubber composition consisting essentially of a blend of about 5 to 50 percent by weight of chopped fibers of about 0.4 centimeters up to about 1.3 centimeters long, about 95 to 50 percent by weight of particulate unvulcanized rubber being capable of passing a 6 mesh U.S. Standard screen.

4,393,155
ENHANCED VISCOSITY MAINTENANCE AND DEMULSIBILITY IN ASPHALT EMULSIONS

William R. Garrett, Jr., Catlettsburg, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 13, 1982, Ser. No. 408,368
Int. Cl.³ C08K 3/20
U.S. Cl. 524—60 10 Claims

1. Asphalt emulsions having demulsibility values of at least about 60%, and viscosity maintenance values of at least about 20 to about 400 Saybolt Furol Seconds over about 240 hours at 65°±10° C. comprising in combination; water, asphalt of penetration in the range of from about 75 to about 300 mm/10, emulsifying agents compatible with said asphalt, and from about 0.05 to about 1.0 percent by weight based on the total weight of said emulsion of an acrylic polymer having molecular weight of above about 1,000,000.

4,393,156
HYDROLYTICALLY STABLE POLYESTER-CARBONATE COMPOSITIONS

Kenneth F. Miller, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

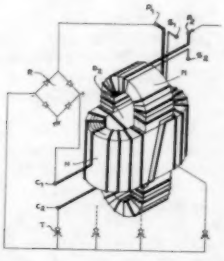
Filed Jul. 20, 1981, Ser. No. 285,351
Int. Cl.³ C08L 69/00, 83/06
U.S. Cl. 524—114 65 Claims

1. An aromatic polyester-carbonate composition having improved hydrolytic stability comprising in admixture an aromatic polyester-carbonate resin and a stabilizing amount of at least one hydrolytic stabilizer selected from the class consisting of epoxy silanes and epoxy siloxanes.

4,393,157
VARIABLE INDUCTOR

Gerald Roberge, Repentigny, and Andre Doyon, Boucherville, both of Canada, assignors to Hydro Quebec, Montreal, Canada

Filed Dec. 5, 1978, Ser. No. 966,555
Claims priority, application Canada, Oct. 20, 1978, 313821
Int. Cl.³ H01F 17/06
U.S. Cl. 323—355 20 Claims



1. A variable inductor comprising a first closed magnetic circuit, formed of an anisotropic material through which flows an alternative magnetic field; a second closed magnetic circuit, also formed of an anisotropic material, through which circulates an adjustable direct current magnetic field; said first and second magnetic circuits being mounted with respect to one another so as to define at least two common magnetic spaces in which the respective alternative and direct magnetic fields are orthogonally superimposed to orient the magnetic dipoles in said common spaces following a direction predetermined by the intensity of said direct current magnetic field of the second circuit and thus to control the permeability of said second magnetic circuit to said alternative field, a coil being wound around the anisotropic material of said first magnetic circuit and a coil being wound around the anisotropic core of said second magnetic circuit and connected to a control circuit governing the intensity of the direct current magnetic field, said control circuit comprising a rectifying bridge connecting the alternative field coil to the direct field coil to accomplish a self-control of said variable inductor.

4,393,158
HYDROLYTICALLY STABLE POLYCARBONATE COMPOSITIONS

Kenneth F. Miller, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 20, 1981, Ser. No. 284,639
Int. Cl.³ C08L 69/00
U.S. Cl. 524—114 12 Claims

1. An aromatic polycarbonate composition exhibiting improved hydrolytic stability comprising in admixture an end-capped aromatic polycarbonate resin and a hydrolytically stabilizing amount of at least one stabilizing compound of the formula

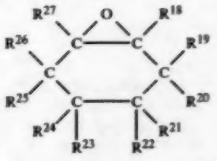
$$Z_nSi(R^3)_{4-n}$$

wherein

n is an integer from 1 to 3 inclusive;

R^3 is independently selected from hydrogen, alkyl radicals; substituted alkyl radicals; alkenyl radicals; cycloalkyl radicals; aryl radicals; alkaryl radicals; aralkyl radicals; divalent organic radicals which together with the silicon atom form a cyclic structure, said organic radicals being selected from divalent saturated aliphatic hydrocarbon radicals and divalent saturated aliphatic organic radicals containing carbon and oxygen atoms in the ring structure; OR^4 radicals wherein R^4 is selected from hydrogen, alkyl radicals, substituted alkyl radicals, alkenyl radicals, aryl radicals, aralkyl radicals, alkaryl radicals, cycloalkyl radicals; $—R^5OR^4$ radicals wherein R^5 is a divalent saturated aliphatic hydrocarbon radical or a divalent aromatic hydrocarbon radical; $—COOR^4$ radicals; $—OOCR^4$ radicals; $—R^5COOR^4$ radicals; $—R^5OOCR^4$ radicals; and polyether radicals.

Z is of the formula



wherein:

(i) R^{18} through R^{27} are independently selected from the class consisting of hydrogen; alkyl radicals; substituted alkyl radicals; alkenyl radicals; aryl radicals; alkaryl radicals; aralkyl radicals; OR^{29} radicals wherein R^{29} is selected from the class consisting of hydrogen, alkyl radicals, substituted alkyl radicals, alkenyl radicals, aryl radicals, alkaryl radicals, and aralkyl radicals; $—R^{30}OR^{29}$ radicals wherein R^{30} is a divalent saturated aliphatic hydrocarbon radical or a divalent aromatic hydrocarbon radical; $—COOR^{29}$ radicals; $—OOCR^{29}$ radicals; $—R^{30}OOCR^{29}$ radicals; $—R^{30}COOR^{29}$ radicals; OR^{31} radicals wherein R^{31} is selected from the class consisting of oxirane ring containing saturated aliphatic hydrocarbon radicals and oxirane ring containing aliphatic-aromatic hydrocarbon radicals; $—R^{30}OOCR^{31}$ radicals; and $—R^{30}COOR^{31}$ radicals; with the proviso that

(ii) one of R^{18} through R^{27} is selected from the class consisting of divalent saturated aliphatic hydrocarbon radicals; divalent aromatic hydrocarbon radicals; 13

OR^{32}— radicals wherein R^{32} is selected from divalent saturated aliphatic hydrocarbon radicals and divalent aromatic hydrocarbon radicals; —$R^{30}OR^{32}$— radicals; —$OOCR^{32}$— radicals; —$COOR^{32}$— radicals; —$R^{30}OOCR^{32}$— radicals; and —$R^{30}COOR^{32}$— radicals.

4,393,159

ANTI-STATIC MATERIAL AND METHOD OF MAKING THE MATERIAL

William Lybrand, Northridge, Calif., assignor to Bengal, Inc., Sepulveda, Calif.

Filed Dec. 4, 1981, Ser. No. 327,470
Int. Cl.³ C09K 3/16
U.S. Cl. 524—243 31 Claims

1. In combination for eliminating static charges by providing resistivities in the range of approximately 10^7 to 10^9 ohms,

polypropylene

a salt in which the positive ion is selected from a group consisting of copper, silver, tin, iron, calcium and iridium, the salt being mixed in the polypropylene in the range of approximately 0.005% to 0.01% by weight, and

ethoxylated amines mixed in the polypropylene in the range of approximately 2.0% to 2.7% by weight.

4,393,160

AQUEOUS DEVELOPABLE POLY(OLEFIN SULFONE) TERPOLYMERS

Thomas R. Pampalone, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 219,517, Dec. 23, 1980, Pat. No. 4,341,861.
This application Feb. 9, 1982, Ser. No. 347,107
Int. Cl.³ C08G 75/22
U.S. Cl. 524—360 7 Claims

1. A positive electron beam resist terpolymer comprising a monomer component and sulfur in a 1:1 molar ratio, said monomer component being comprised of from about 70 mole percent to about 93 mole percent of 3-methylcyclopentene and from about 7 mole percent to about 30 mole percent of 2-cyclopentene-1-acetic acid.

4,393,161

HIGH IMPACT, HIGH MODULUS REINFORCED AROMATIC CARBONATE POLYMERIC MIXTURES

Petrus C. A. M. Van Abeelen, Gilze, and Hans de Munck, Huybergen, both of Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Jul. 9, 1981, Ser. No. 281,710
Int. Cl.³ C08L 69/00, 25/04
U.S. Cl. 524—506 7 Claims

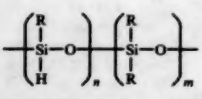
1. A high impact strength, high modulus thermoplastic composition comprising an intimate admixture of:

(a) an aromatic carbonate polymer or copolymer;

(b) a polystyrene resin, the total weight of (a) plus (b) being from about 35 to about 95 parts of the composition;

(c) from about 5 to about 65 parts by weight of a pristine fibrous reinforcing agent; and

(d) from about 0.05 to about 4 parts by weight of a hydrogen siloxane comprising units of the formula:



wherein R is hydrogen, C_1–C_{10} alkyl, phenyl or a mixture thereof, and n plus m is at least about 4.

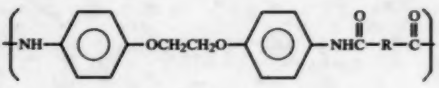
4,393,162

POLYAMIDES AND COPOLYAMIDES COMPRISING -1,2-DI(P-AMINOPHENOXY) ETHANE MOIETIES

Edward E. Paschke, Wheaton, and C. Bruce Petty-Weeks, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 14, 1982, Ser. No. 378,119
Int. Cl.³ C08G 69/32, 69/40
U.S. Cl. 524—606 30 Claims

1. A polyamide comprising the following recurring structure:



wherein R is a divalent aliphatic or aromatic hydrocarbon radical or an aromatic hydrocarbon radical containing from 6 to 10 carbon atoms joined directly or by a stable linkage selected from the group consisting of —O—, methylene

—SO—, —SO_2— and S radicals.

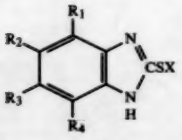
4,393,163

METHOD FOR STABILIZING AN ACRYLAMIDE POLYMER IN A PETROLEUM RECOVERY PROCESS

Shoichi Kanda, and Gengiro Kawamura, both of Yokohama, Japan, assignors to Nitto Chemical Industry, Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 970,022, Dec. 14, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,672
Claims priority, application Japan, Dec. 14, 1977, 52-149330; Nov. 6, 1978, 53-136440; U.S.S.R., Dec. 18, 1978, 2701054
Int. Cl.³ C08K 5/45
U.S. Cl. 524—608 1 Claim

1. An aqueous solution of an acrylamide polymer stabilized for use in a petroleum recovery process comprising a partially hydrolyzed polyacrylamide, water, and a stabilizing effective amount of 2-mercaptobenzoimidazole or a water-soluble salt thereof having the general formula



wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom or a lower alkyl group, and X represents a hydrogen atom, an alkali metal atom or an ammonium group.

4,393,164
TRANSPARENT IMPACT-RESISTANT MOLDING MATERIAL

Graham E. McKee, Weinheim; Franz Haaf, Bad Durkheim; Juergen Hambrecht, Heidelberg; Klaus Benker, Neustadt; Rudolf Stephan, Ludwigshafen, and Hans Breuer, Battenberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,407

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113627

Int. Cl.[3] C08L *51/04, 33/12, 25/12*

U.S. Cl. 525—83 4 Claims

1. Transparent, impact resistant molding material which can be processed above 200° C. without recognizable yellowing and odor development, consisting of a mixture of

(A) 15 to 70 parts by weight of a methylmethacrylate polymer containing 90 to 100 percent by weight of a methylmethacrylate and 10 to 0 percent by weight of an alkylacrylate having 1 carbon atom to 8 carbon atoms in the alkyl radical,

(B) 10 to 50 parts by weight of a styrene/acrylonitrile copolymer containing 78 to 88 parts by weight styrene and 22 to 12 parts by weight acrylonitrile,

(C) 20 to 50 parts by weight of a copolymerized graft polymer mixture and

(D) additives in an amount from 0 to 20 percent by weight relative to the total of components A, B and C wherein the parts by weight of A, B and C total 100 and where the difference between the refractory index of component C and the refractive index of the mixture of components A, B and D is less than 0.005,

wherein the copolymerized graft polymer mixture C is produced by grafting

(C_1) 50 to 80 percent by weight relative to the copolymerized graft polymer C of a diene elastomeric grafting base having a glass temperature below −20° C. with

(C_2) 20 to 50 percent by weight consisting of of the following components as a mixture or in sequence:

(C_{21}) 40 to 100 parts by weight of one or more methacrylates of C_1–C_8 alkanols and

(C_{22}) 0 to 60 parts by weight of styrene or an alkylstyrene having up to 12 carbon atoms.

4,393,165
POLYMER COMPOSITIONS

Takashi Sasaki, Takasaki; Miyuki Hagiwara, Maebashi; Fumio Hosoi, Fujioka, and Tohru Takagi, Hiratsuka, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,974

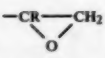
Claims priority, application Japan, Aug. 12, 1981, 56-126458

Int. Cl.[3] C08G *63/76;* C08L *67/00*

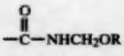
U.S. Cl. 525—10 12 Claims

1. A polymer composition which consists essentially of:

(A) 90 to 50 wt.% of a saturated polymer having in one molecule (1) at least two groups of at least one type selected from the group consisting of an epoxy group of the formula

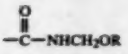


(R is hydrogen or methyl), an alcoholic or phenolic hydroxyl group and an alkoxymethyl-substituted acid amide group of the formula



(R is an alkyl group of C_1 to C_4) and (2) a repeating unit made of a nonaromatic methylene group or methine group; and

(B) 50 to 10 wt.% of a nonfunctional radical polymerizable monomer mixture consisting of (a) a radical polymerizable monomer having in one molecule at least one functional group selected from the group consisting of a carboxyl group, an acid anhydride group, an alcoholic hydroxyl group, an alkoxymethyl-substituted acid amide group of the formula



(R is an alkyl group of C_1 to C_4) and an amino group of the formula $—NR_1R_2$ (R_1 and R_2 are each an alkyl group of C_1 to C_8) and an ethylenic double bond, and (b) a radical polymerizable monomer having one epoxy ring and one ethylenic double bond in one molecule.

3. A polymer composition according to claim 1 wherein the saturated polymer is a saturated polyester prepared from a saturated divalent alcohol and a saturated dibasic acid.

4,393,166
PROCESS FOR THE PREPARATION OF POLYADDITION PRODUCTS OF ISOCYANATES AND DENATURED BIOMASSES, THEIR USE AS REACTIVE FILLERS AND AS PLANT NUTRIENTS AND A PROCESS FOR THE PRODUCTION OF SHEETS OR SHAPED ARTICLES USING THE POLYADDITION PRODUCTS

Artur Reischl, and Kuno Wagner, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,859

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920525

Int. Cl.[3] C08G *83/00;* C05F *11/00;* C08K *11/00;* B29J *5/00*

U.S. Cl. 525—27 17 Claims

1. A process for the production of denatured polyaddition products of biomasses and isocyanates, comprising reacting

(A) from 5 to 98%, by weight, based on (A)+(B), of a biomass based on microorganisms or derivative and decomposition products thereof with

(B) from 95 to 2%, by weight, based on (A)+(B), of a compound containing isocyanate groups, at temperatures of at least 50° C. with complete denaturing of component (A).

11. The process of claim 1, wherein said biomass is an aqueous or dried sludge from industrial or communal purification plants which were optionally subjected to aerobic or anaerobic digestion.

4,393,167
POLYMER BLENDS CONTAINING POLYMER OF β-HYDROXYBUTYRIC ACID AND CHLORINE OR NITRILE GROUP CONTAINING POLYMER

Paul A. Holmes, Middlesbrough; Frank M. Willmouth, Royston, and Alan B. Newton, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 10, 1981, Ser. No. 320,127

Claims priority, application United Kingdom, Nov. 18, 1980, 8036967

Int. Cl.[3] C08L *67/04, 27/06, 33/18*

U.S. Cl. 525—64 20 Claims

1. A polymer blend comprising (i) 0.2 to 95% by weight of a β-hydroxybutyric acid polymer of molecular weight above 50,000 and containing 100 to 50 mole % of β-hydroxybutyric acid residues and correspondingly 0–50 mole % of β-hydroxyvaleric acid residues in the polymer chain, and (ii) an organic polymer containing at least 25% by weight of chlorine and/or nitrile groups.

4,393,168

BLENDS OF POLYETHERIMIDES AND RUBBER MODIFIED VINYL AROMATIC POLYMERS

Harold F. Giles, Jr., Cheshire, Mass., and Dwain M. White, Schenectady, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 18, 1982, Ser. No. 359,261
Int. Cl.³ C08L 79/08
U.S. Cl. 525—66 12 Claims

1. A composition comprising a blend of (a) a rubber modified vinyl aromatic polymer and (b) a polyetherimide.

4,393,169

MOLDABLE RESIN COMPOSITIONS CONTAINING POLYCARBONATE STYRENE POLYMER AND THREE PHASE GRAFT POLYMER

Takeshi Moriwaki, Sakai, and Shinji Tokuhara, Himeji, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Nov. 12, 1981, Ser. No. 320,629
Int. Cl.³ C08L 25/04, 69/00, 51/00
U.S. Cl. 525—67 6 Claims

1. A thermoplastic moldable resin composition, the resin components of which consist essentially of a blend of

I. 100 parts by weight of a mixture comprising

(A) from 95 to 5 parts by weight of an aromatic vinyl polymer, and

(B) from 5 to 95 parts by weight of thermoplastic polycarbonate resin, and

II. from 1 to 20 parts by weight of

(C) a three-stage polymer produced by three, sequential, emulsion polymerization stages, wherein

(1) in the first emulsion polymerization stage, a mixture of (a) from 50 to 100 percent by weight of first, aromatic, vinyl monomer, (b) from 0 to 50 percent by weight of second, vinyl monomer different from said first monomer and copolymerizable therewith and (c) from 0 to 10 percent by weight of a multifunctional bridge-forming monomer, is emulsion polymerized to obtain a first stage polymer,

(2) in the second emulsion polymerization stage, a mixture of (a) said first stage polymer and (b) a monomer mixture of (i) from 50 to 100 percent by weight of butadiene, (ii) from 0 to 50 percent by weight of a third, vinyl monomer copolymerizable with said butadiene, and (iii) from 0 to 1 percent by weight of a multifunctional bridge-forming monomer, is emulsion polymerized to obtain a second stage polymer, and

(3) in the third emulsion polymerization stage, a mixture of (a) said second stage polymer and (b) a monomer mixture of (i) from 50 to 100 percent by weight of an alkyl methacrylate having 1 to 4 carbon atoms in the alkyl group, (ii) from 0 to 50 percent by weight of a fourth, vinyl monomer different from said alkyl methacrylate and copolymerizable therewith, and (iii) from 0 to 10 percent by weight of a multifunctional bridge-forming monomer, is emulsion polymerized.

4,393,170

POLYMERIC BLENDS

John R. Haws, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 145,091, Apr. 30, 1980, abandoned. This application Jul. 22, 1981, Ser. No. 286,097
Int. Cl.³ C08L 53/00
U.S. Cl. 525—89 6 Claims

1. A composition of matter that is a blend of polymers comprising:

(a) a block copolymer of lactone with a comonomer chosen from the group consisting of (1) conjugated diene, (2) monovinylarene, and (3) both conjugated diene and monovinylarene,

(b) acrylic ester polymer,

(c) coumarone-indene resin, and

(d) conjugated diene-monovinylarene teleblock copolymer represented by the general formula $(A—B—)_nY$ wherein A represents a block of polymerized monovinylarene monomer, B represents a block of polymerized conjugated diene units or alternatively a random or random tapered block copolymer of conjugated diene and monovinylarene monomers, Y is the residual unit from a polyfunctional coupling agent or a polyfunctional initiating species and n has a value from 2 to 6.

4,393,171

PROCESS FOR PREPARING RUBBERY POLYMER REINFORCED STYRENIC RESINS

William J. I. Bracke, Hamme, and Emmanuel Lanza, Waterloo, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Feb. 26, 1981, Ser. No. 238,414
The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.
Int. Cl.³ C08F 257/02
U.S. Cl. 525—309 43 Claims

1. A process for continuous preparation of a rubbery polymer material reinforced styrenic resin comprising the steps of:

a. adding a monomer material selected from the group consisting of alkyl esters of acrylic acid, alkyl esters of methacrylic acid and mixtures thereof, together with a polyfunctional cross-linking agent to a first solution of a copolymeric matrix of a styrenic compound and an acrylonitrile compound in an inert solvent, whereby there is formed a second solution of monomer material, polyfunctional cross-linking agent and said copolymeric matrix in said inert solvent;

b. continuously charging said second solution into a polymerization zone and subjecting said second solution in said polymerization zone to mass polymerization conditions to polymerize said monomer material whereby there is formed in situ a cross-linked rubbery material dispersed in said copolymeric matrix;

c. continuously withdrawing the reaction mixture from said polymerization zone and continuously charging the withdrawn mixture into a devolatilization zone to remove the inert solvent and any residual monomer material, and

d. recovering a rubbery polymer material reinforced styrenic resin wherein the rubbery material formed in situ is highly dispersed in the copolymer matrix.

4,393,172

HIGH-NOTCHED-IMPACT CORE-SHELL POLYMERS HAVING IMPROVED WEATHER RESISTANCE

Christian Lindner, Cologne; Karl-Heinz Ott, Leverkusen, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 235,096, Feb. 17, 1981, abandoned. This application Oct. 8, 1981, Ser. No. 309,569
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006804
Int. Cl.³ C08L 51/04; C08F 279/02, 265/04
U.S. Cl. 525—310 6 Claims

1. Particulate graft polymer comprising

(a) a core which is a crosslinked homopolymer of a conjugated diene or a copolymer thereof with up to 10% by weight of copolymerized styrene or acrylonitrile and having a gel content of more than 50%,

(b) a first shell which is a crosslinked rubber formed by polymerizing a monomer mixture consisting of at least one acrylic acid alkyl ester having 1 to 8 carbon atoms in the alkyl moiety and 0.05 to 10% by weight, based on the weight of (b), of a crosslinking polyfunctional monomer and

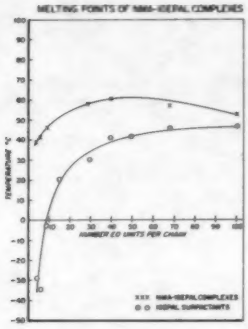
(c) a second shell of a polymer of at least one resin-forming monomer selected from the group consisting of α-methyl styrene, styrene, acrylonitrile and methyl methacrylate.

4,393,173

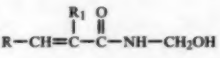
COMPLEXES OF N-METHYLOLACRYLAMIDES WITH POLYALKOXYLATES AND POLYMERIZATION TO UNGELLED POLY(N-METHYLOLACRYLAMIDES)

Wiley E. Daniels, Easton, and Dennis J. Nagy, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 21, 1981, Ser. No. 303,732
Int. Cl.³ C08L 33/24; C08G 69/48
U.S. Cl. 525—329.4 17 Claims



1. A composition of matter comprising a complex consisting essentially of (1) an N-methylol monomer of the following general formula:



wherein R is hydrogen, lower alkyl (C_1–C_4), isopropenyl, or phenyl radical and R_1 is hydrogen or methyl radical and (2) a polyalkoxylate substance having at least a portion of its structure represented by $(\text{alkylene oxide})_x$, wherein x is an integer greater than one, the complex containing at least about x molecules of the N-methylol monomer per molecule of polyalkoxylate.

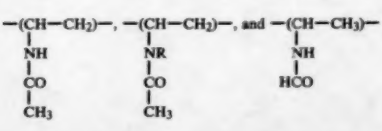
4,393,174

BASE HYDROLYSIS OF PENDANT AMIDE POLYMERS

Daniel J. Dawson, Los Altos, and Phillip J. Brock, Sunnyvale, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Nov. 9, 1981, Ser. No. 319,614
Int. Cl.³ C08F 8/12
U.S. Cl. 525—369 10 Claims

1. The process of treating a polymer having recurring pendant amide units having a structure selected from among



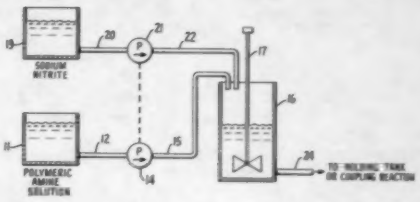
wherein R is a lower alkyl to form pendant amine units which comprises contacting said polymer in liquid phase with aqueous strong base at elevated temperature for a time effective to hydrolyze said amide units to amine units.

4,393,175

PROCESS FOR THE CONTINUOUS DIAZOTIZATION OF WATER-SOLUBLE POLYMERIC AMINES

Phillip J. Brock, Sunnyvale, and Daniel J. Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Sep. 9, 1981, Ser. No. 300,621
Int. Cl.³ C08F 8/30
U.S. Cl. 525—377 6 Claims



1. In a process of diazotizing a polymeric aromatic amine wherein a solution of the polymeric amine is admixed with a solution of nitrite ion, the improvement comprising continuously feeding said solutions to a turbulent reaction zone at a combined liquid flow rate of not less than one reaction zone volume per minute and continuously withdrawing the resulting reaction product to maintain the reaction zone liquid volume.

4,393,176

ANTI-STATIC MATERIAL AND METHOD OF MAKING THE MATERIAL

William Lybrand, Northridge, Calif., assignor to Bengal, Inc., Sepulveda, Calif.

Filed Dec. 4, 1981, Ser. No. 327,471
Int. Cl.³ C09K 3/16
U.S. Cl. 525—379 20 Claims

1. In combination for eliminating static charges by providing a resistivity in the range of approximately 10^{11} to 10^{12} ohms,

a first material selected from a group selected from a group consisting of polystyrene and modified styrenes, and

ethoxylated amines mixed with the first material in a range of approximately four percent (4%) to twelve percent (12%) by weight.

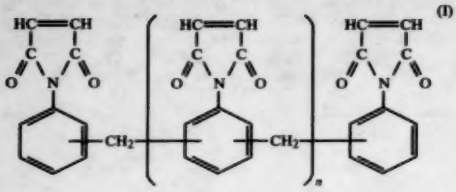
4,393,177

THERMOSETTING RESIN COMPOSITION, PROCESS FOR PREPARATION THEREOF AND CURED PRODUCT THEREOF

Takeo Ishii; Masatsugu Ogata, both of Hitachi, and Toshikazu Narahara, Tokai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,617
Claims priority, application Japan, Mar. 11, 1980, 55/29810; Mar. 12, 1980, 55/30354; Mar. 12, 1980, 55/30355
Int. Cl.³ C08F 283/04; C08G 73/16; C08L 79/08
U.S. Cl. 525—422 24 Claims

1. A thermosetting resin composition which comprises an admixture consisting of tri-allylisocyanurate, a polymaleimide represented by the following general formula:



(I)

wherein n is a number of at least 1, and a thermoplastic resin, the amount of said thermoplastic resin is 1 to 20 parts by weight per 100 parts by weight of said polymaleimide and said tri-allylisocyanurate, said thermoplastic resin having a glass transition temperature lower than the curing temperatures of other components in said admixture and the amount of said tri-allylisocyanurate is 3 to 300 parts by weight per 100 parts by weight of the polymaleimide.

4,393,178

FAST CRYSTALLIZING POLYESTER COMPOSITIONS

Roger M. H. Legras, Hannut; Jean-Jacques E. R. G. Biebuyck, Rixensart, and Jean P. Mercier, Kessel-Lo, all of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 159,916, Jun. 16, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,382

Claims priority, application United Kingdom, Jun. 19, 1979, 7921321

Int. Cl.³ C08F *283/00;* **C08G** *63/76;* **C08L** *63/00*

U.S. Cl. 525—437 **11 Claims**

1. A fast crystallising polyester composition obtained by reacting a polyester which polyester comprises at least 90 mole % of residues of ethylene terephthalate with an ionisable metal salt of an organic compound having at least one acidic proton and at least one aromatic ring in which the ionisable metal salt is one which, when present in polyethylene terephthalate at a concentration of 1% by weight, will:

(a) give a difference in the crystallisation peak temperatures ($\Delta T = Tc - Tn$) of at least 100° measured by differential scanning calorimetry on heating (Tn) and on cooling (Tc) using heating and cooling rates of 10° C./minute, and

(b) has a melt degradation value (K value) measured in polyethylene terephthalate according to the method given in Makromol Chem 179, 2201–2209 (1978) of less than 60.

4,393,179

SYNTHETIC RESIN

Karl Hoppe, and Udo Strauss, both of Münster, Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,109

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045251

Int. Cl.³ C08L *63/00, 61/34*

U.S. Cl. 525—490 **21 Claims**

1. A synthetic resin in the form of a metal complex compound comprising a reaction product of:

(a) Mannich bases which are free from epoxide groups; with

(b) epoxide resins; wherein aliphatic hydroxy groups originating from (a), (b), or a mixture thereof are at least partially converted into urethane groups by reaction with partially blocked isocyanate, said Mannich base (a) formed from components selected from:

(a_1) condensed phenols which are free from ether groups and contain at least two aromatic rings and at least two phenolic hydroxyl groups;

(a_2) condensed phenols which contain other groups and contain at least two aromatic rings and at least two phenolic hydroxyl groups;

(a_5) formaldehyde or compounds which split off formaldehyde;

(a_3) secondary amines having at least two hydroxyalkyl group; and

(a_4) dialkylamines or dialkoxyalkylamines which do not contain free hydroxyl groups; or from the components:

(a_1) and (a_2) with (a_5) and (a_3);

(a_1) with (a_5) and (a_3);

(a_2) with (a_5) and (a_3);

(a_1) with (a_5), (a_3), and (a_4); or

(a_2) with (a_5), (a_3), and (a_4); and copper complex bound with said reaction product to form said metal complex compound.

4,393,180

CURING AGENTS FOR EPOXIDE RESINS AND COMPOSITIONS CONTAINING THEM

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,468

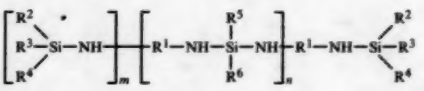
Claims priority, application United Kingdom, Jun. 30, 1981, 8120142

Int. Cl.³ C08L *61/00, 61/06*

U.S. Cl. 525—504 **10 Claims**

1. Compositions for curing epoxide resins and activated by water, said compositions comprising

(a) a silamine of the formula



II

where

either m represents 1, in which case R^1 represents the divalent residue of an aromatic, aliphatic, araliphatic, or cycloaliphatic diprimary amine after removal of the two primary amino groups and n represents zero or an integer of from 1 to 10, or m represents 2, in which case R^1 represents the trivalent residue of an aliphatic triprimary amine after removal of the three primary amino groups and n represents zero, and

R^2, R^3, R^4, R^5, and R^6, which may be the same or different, each represent an alkyl group of 1 to 8 carbon atoms or an aryl group of 6 to 10 carbon atoms, and

(b) as accelerator, a substantially anhydrous organic acid or a substantially anhydrous phenol.

4,393,181

POLYFUNCTIONAL PHENOLIC-MELAMINE EPOXY RESIN CURING AGENTS

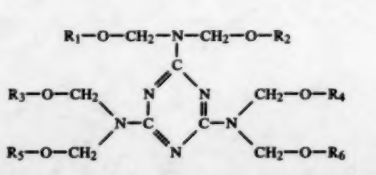
Roy A. Allen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1982, Ser. No. 393,974

Int. Cl.³ C08L *61/00;* **C08G** *59/14;* **C08F** *283/00*

U.S. Cl. 525—504 **9 Claims**

1. An epoxy resin curing agent prepared by reacting a polyhydric phenol with an amino-triazine having the general formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different alkyl radicals of 1 to 4 carbon atoms, said polyhydric phenol

and amino-triazine being reacted in an amount to provide at least two phenolic hydroxyl groups to one alkoxy group.

5. A heat curable composition, especially suitable for powder coating applications, comprising:

(a) at least one normally solid epoxy resin containing at least one vicinal epoxy group,

(b) a curable amount of a curing agent prepared as in claim 1, and

(c) an alkaline epoxy curing agent accelerator.

4,393,182

OLEFIN POLYMERIZATION PROCESS WITH NOVEL SUPPORTED TITANIUM CATALYST COMPOSITIONS

Brian L. Goodall; Adrianus A. van der Nat, and Willem Sjardijn, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 143,578, Apr. 25, 1980, Pat. No. 4,329,253. This application Nov. 5, 1981, Ser. No. 318,649

Claims priority, application United Kingdom, May 17, 1979, 7917240

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—125 **21 Claims**

1. Process for the polymerization of alpha-monoolefins which comprises contacting the monomers to be polymerized with a catalyst composition comprising an organoaluminum compound, a selectivity control agent, or an at least partial reaction product of those two components, and a titanium-containing catalyst component obtained by:

i contacting with a halohydrocarbon in liquid phase a solid reaction product comprising a magnesium halide in which the atomic ratio of halogen to magnesium is at least 1.2:1, a titanium halide and an electron donor;

ii optionally washing the resulting solid with an inert diluent to remove liquid remaining from the contacting step;

iii contacting the resulting solid with a halide of tetravalent titanium in liquid phase; and

iv washing the resulting solid with an inert diluent to remove residual unreacted titanium compound;

and recovering the resulting olefin polymer.

4,393,183

2-CYANOACRYLATE ADHESIVE COMPOSITION

Kaoru Kimura, Kuroishi, and Kyoji Sugiura, Nagoya, both of Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

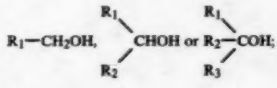
Filed Dec. 11, 1981, Ser. No. 329,918

Claims priority, application Japan, Dec. 16, 1980, 55-176502

Int. Cl.³ C08F *20/42, 120/42*

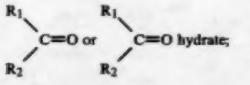
U.S. Cl. 526—245 **11 Claims**

1. An adhesive composition which comprises 2-cyanoacrylate and at least one compound selected from the group consisting of the following compounds:



(1)

(2) R_1—CHO or R_1—CHO hydrate;



(3)

(4) pentafluorophenol;

(5) hexachloroacetone or hexachloroacetone hydrate; and

(6) chloral or chloral hydrate

wherein R_1 is a fluorinated alkyl or aryl group having up to 12 carbon atoms, and R_2 and R_3 are fluorinated or non-fluorinated alkyl or aryl groups having up to 12 carbon atoms, as an anionic-polymerization inhibitor.

4,393,184

LENS HAVING A HIGH REFRACTIVE INDEX WITH A LOW DISPERSION

Niro Tarumi; Shigeo Komiya, both of Akishima, and Mitsuo Sugimura, Fussa, all of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

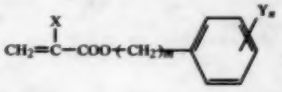
Filed Oct. 26, 1981, Ser. No. 315,354

Claims priority, application Japan, Dec. 15, 1980, 55/175779

Int. Cl.³ C08F *18/16*

U.S. Cl. 526—261 **2 Claims**

1. A lens having a low dispersion and a high refractive index, comprising a copolymer of at least one polyfunctional allyl monomer selected from the group consisting of diallylorthophthalate, diallylisophthalate, diallylterephthalate, diallylchlorendate, triallylcyanurate and triallylisocyanurate with at least one monomer of the formula



in which

X is H, CH_3 or Cl,

Y is H, CH_3, C_2H_5, n-C_3H_7, iso-C_3H_7, OCH_3, C_6H_{11}, Cl, Br, CH_2Cl, CH_2Br, C_6H_5, $CH_2C_6H_5$ or SCH_3,

m is 0, 1 or 2, and

n is 0, 2, 3, 4 or 5,

the polyfunctional allyl monomer comprising about 70 to 90% of the copolymer by weight, at most about 10% by weight of the polyfunctional allyl monomer comprising a trifunctional allyl monomer.

4,393,185

THERMALLY POLYMERIZABLE MIXTURES AND PROCESSES FOR THE THERMALLY-INITIATED POLYMERIZATION OF CATIONICALLY POLYMERIZABLE COMPOUNDS

Godwin Berner, Rheinfelden, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 21, 1982, Ser. No. 380,801

Claims priority, application Switzerland, Jun. 2, 1981, 3599/81

Int. Cl.³ C08G *77/04*

U.S. Cl. 528—27 **5 Claims**

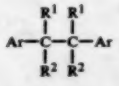
1. A thermally polymerisable mixture which comprises

(A) one or more cationally polymerisable compounds,

(B) a quaternary ammonium salt of an aromatic-heterocyclic compound which contains 1 or 2 N-atoms, and of a complex halide anion selected from the series consisting of $BF_4^{\ominus}$, $PF_6^{\ominus}$, $SbF_6^{\ominus}$, $SbF_5(OH)^{\ominus}$ or $AsF_6^{\ominus}$,

(C) a thermal radical former selected from one of the following classes

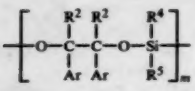
(C_1) diaryl ethane derivatives of the formula I



(I)

wherein Ar is phenyl, naphthyl or phenyl which is substituted by C_1–C_4alkyl or chlorine, R^1 is OH, C_1–C_4alkoxy, —O—CO—R^3 or —Osi(R^4)(R^5)(R^6), wherein R^3 is C_1–C_8alkyl or phenyl, and each of R^4, R^5 and R^6 independently of the other is C_1–C_4alkyl or phenyl, and R^2 is C_1–C_4alkyl, cyclohexyl or Ar,

(C_2) an oligomeric compound of the Formula II



(II)

wherein m is 2 to 20,
(C_3) an organic peroxide compound or
(C_4) a quinone, and
(D) optionally further additives.

4,393,186

THERMOPLASTIC POLYURETHANES PREPARED BY REACTING POLYISOCYANATE, POLYESTER POLYOL, CYCLOALIPHATIC DIOL AND A MONOFUNCTIONAL CHAIN-TERMINATING COMPOUND

Dennis J. Damico, and Vincent J. Pascarella, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 153,558, May 27, 1980, abandoned, which is a division of Ser. No. 50,070, Jun. 19, 1979, Pat. No. 4,250,274. This application Aug. 27, 1981, Ser. No. 296,629
Int. Cl.³ C08G *18/30*
U.S. Cl. 528—49 **10 Claims**

1. A heat-resistant, thermoplastic polyurethane substantially free of reactive isocyanate and hydroxyl groups comprising the reaction product of

(a) at least one polyisocyanate having at least two reactive isocyanate groups;
(b) at least one polyester polyol having at least two hydroxyl groups;
(c) at least one cycloaliphatic diol chain-extending agent; and
(d) at least one monofunctional isocyanate-reactive chain-terminating compound;

said polyisocyanate being present in an excess amount with respect to said polyester polyol and said cycloaliphatic, diol;

said monofunctional isocyanate-reactive compound being present in an amount sufficient to ensure reaction of excess isocyanate groups;

said polyester polyol having been prepared from the reaction of

(i) at least one saturated acyclic, cyclic or aromatic monomeric or polymeric polyol having at least two hydroxyl groups;
(ii) from 30 to 100 mole present terephthalic acid; and
(iii) from 70 to 0 mole percent of at least one saturated or unsaturated acyclic, cyclic or aromatic carboxylic acid, other than terephthalic acid, having at least two carboxyl groups;

said polyurethane having a molecular weight of at least 20,000.

4,393,187

STAIN RESISTANT, ABRASION RESISTANT POLYURETHANE COATING COMPOSITION, SUBSTRATE COATED THEREWITH AND PRODUCTION THEREOF

Joseph Boba, Fort Lee, and Robert P. Conger, Park Ridge, both of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Filed Oct. 23, 1982, Ser. No. 391,796
Int. Cl.³ C08G *18/62*
U.S. Cl. 528—60 **8 Claims**

1. Homogeneous, unitary, crosslinked polyurethane coating on a substrate wherein the nitrogen atoms of the polyurethane structures are joined to alicyclic rings or to straight aliphatic chains and the crosslinkages consist essentially of crosslinks between polyurethane structures, via isocyanate residues and triol or tetrol residues forming in combination, urethane group crosslinkages in the polyurethane structures; and crosslinks between polyurethane structures, deriving from double bonds in diacrylates, triacrylates or tetra acrylates and acrylate moieties which esterify alkane or polyether diol, triol or tetrol residues, which residues are linked as urethanes to the polyurethane structures; said coating also having urea groups linking the polyurethane structures; and wherein on an equivalent basis the ratio of double bond crosslinkages:urethane group crosslinkages joining polyurethane structures, formed by triol or tetrol residues, is between 1.0 and 2.5; where the number of equivalents of double bond crosslinkage in the coating is taken as being equal to the number of equivalents of carbon-carbon double bond in the uncured coating composition, and the number of equivalents of urethane crosslinkage in the coating is taken as being equal to the number of equivalents of hydroxyl group provided by the triols and the tetrols in the uncured coating composition; and in said coating the content of urethane groups in the main polyurethane chains amounts on an equivalent weight basis to about 40% up to no more than 70% of the total of urethane groups in the main polymer chains plus urethane crosslinkages plus urea groups present in said coating; the content of urethane group crosslinkages, formed from triol or tetrol residues, amounts to between about 20 and about 40 equivalent weight percent of said total of main chain urethane groups, urethane crosslinkages and urea groups and the content of urea groups in said coating amounts to between about 5 to about 25 equivalent percent of the total of said urethane main chain groups, urethane crosslinkages and urea groups and calculated as weight of unreacted isocyanate groups available for conversion to urea groups, amounts to about 0.5 to about 5 percent by weight of said coating; and in said coating, the vinyl groups other than those of acrylate groups incorporated by urethane links in the polyurethane structures, are combined via double bond linkages with each other and with said acrylate groups incorporated in the polyurethane structures.

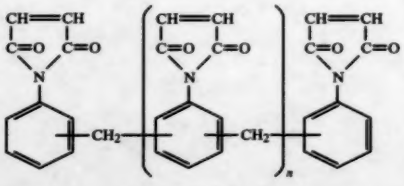
4,393,188

THERMOSETTING PREPOLYMER FROM POLYFUNCTIONAL MALEIMIDE AND BIS MALEIMIDE

Akio Takahashi, Hitachiohta; Motoyo Wajima, Hitachi; Ritsuro Tada, Mito; Hirosada Morishita, Hitachi; Yutaka Mizuno, Shimodate; Shunya Yokozawa, Oyama, and Kenji Tsukanishi, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Feb. 12, 1981, Ser. No. 233,746
Claims priority, application Japan, Feb. 14, 1980, 55-18094
Int. Cl.³ C08G *59/06*; G08G *59/08*
U.S. Cl. 528—88 **8 Claims**

1. A process for preparing a thermosetting maleimide prepolymer, which comprises reacting (A) a polyfunctional maleimide compound obtained by the dehydration reaction of an amide acid formed from maleic anhydride and a polyamine prepared by the condensation of aniline with formaldehyde and represented by the formula (1)



(1)

wherein n is in the range of from 0.1 to 3.0, (B) at least one bis-maleimide selected from the group consisting of N,N'-m-phenylene-bis-maleimide, N,N'-p-phenylene-bis-maleimide, N,N'-4,4'-diphenylmethane-bis-maleimide, N,N'-4,4'-diphenyl-ether-bis-maleimide, N,N'-methylene-bis(3-chloro-p-phenylene)-bis-maleimide, N,N'-4,4'-diphenylsulfone-bis-

maleimide, N,N'-m-xylene-bis-maleimide and N,N'-4,4'-diphenylcyclohexane-bis-maleimide, (C) at least one diamine selected from the group consisting of m-phenylenediamine, p-phenylenediamine, 4,4'-diaminodiphenylmethane, 2,2'-bis(4-aminophenyl)propane, benzidine, 4,4'-diaminodiphenylsulfone, bis(4-aminophenyl)methylphosphine oxide, bis(4-aminophenyl)phenylphosphine oxide, bis(4-aminophenyl)methylamine, 1,5-diaminonaphthalene, m-xylylenediamine, p-xylylenediamine, 4,4'-diaminobenzophenone, 4,4'-diaminoazobenzene, bis(4-aminophenyl)phenylmethane, 1,1-bis(4-aminophenyl)cyclohexane, 1,1-bis(4-amino-3-methylphenyl)cyclohexane, 2,5-bis(m-aminophenyl)-1,3,4-oxadiazole, 2,5-bis(p-aminophenyl)-1,3,4-oxadiazole, 2,5-bis(m-aminophenyl)-thiazolo(4,5-d)thiazole, 5,5'-di(m-aminophenyl)-2,2'-bis(1,3,4-oxadiazolyl), 4,4'-diaminodiphenyl ether, 4,4'-bis(p-aminophenyl)-2,2'-dithiazole, m-bis(4-p-aminophenyl-2-thiazolyl)-benzene, 4,4'-diaminobenzanilide, 4,4'-diaminophenyl benzoate, N,N'-bis(4-aminobenzyl)-p-phenylenediamine and 4,4'-methylenebis(2-chloroaniline), wherein the weight proportion of said polyfunctional maleimide compound (A) relative to the total of said polyfunctional maleimide compound (A) and said at least one bis-maleimide (B) is 3 to 80%, and the molar ratio of the total of said polyfunctional maleimide compound (A) and said at least one bis-maleimide (B) relative to said at least one diamine (C) is 1:2 to 1:0.1, said process further comprising a reaction with (D) at least one 1,2-epoxy compound which, when polymeric, has a weight average molecular weight of up to 5,000, and the process comprising the reaction between (A), (B), (C) and (D) being performed in one or more stages, provided that in any stage involving a reaction in which said at least one 1,2-epoxy compound (D) participates, the reaction is effected at a temperature of 50° to 145° C. for a period of time of 5 to 240 minutes and that in any stage involving a reaction in which said at least one 1,2-epoxy compound (D) does not participate, the reaction is effected at a temperature of 70° to 180° C. for a period of time of 5 to 240 minutes, and wherein the weight proportion of said at least one 1,2-epoxy compound (D) relative to the total of said polyfunctional maleimide compound (A), said at least one bis-maleimide (B), said at least one diamine (C) and said at least one 1,2-epoxy compound (D) is 5 to 80%.

4,393,189

METHOD OF PREPARING A PHENOLIC ALDEHYDE RESIN AND RESIN COMPOSITION FOR AN ADHESIVE SYSTEM TO BE APPLIED TO GLASS FIBERS

Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 163,355, Jun. 26, 1980, abandoned, which is a continuation-in-part of Ser. No. 956,473, Oct. 30, 1978, Pat. No. 4,314,050. This application Nov. 16, 1981, Ser. No. 321,971

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.³ C08G 8/22

U.S. Cl. 528—155 **6 Claims**

1. An improved flexible and tough resorcinolic or resorcinolic and phenolic aldehyde resin, comprising a thermoplastic, water soluble, resorcinol or resorcinol and a phenolic aldehyde resin that is a mixture of polymers having trimer polymer and dimer polymer and no higher non-water soluble oligomers produced by:

a. reacting to less than 100 percent completion a resorcinol or resorcinol and phenolic compound with an aldehyde in an amount of aldehyde to resorcinol or aldehyde to mixture of resorcinol and phenolic compound in mole ratio in the range of about 0.8 to about 1.5 and at a pH in the range of about 3.5 to about 5.5 to limit formation of resorcinol and phenolic alcohols and for a period of time equivalent to a period of time in the range of about 3 hours to about 10 hours at a temperature in the range of about 55° F. (13° C.) to about 90° F. (32° C.) to produce a resinous polymer mixture along with unreacted resorcinol, or resorcinol and phenolic compound and aldehyde in the polymer mixture, and

b. continuing the resin reaction at a pH maintained above 7 to about 7.5 at a temperature in the range of 55° F. (13° C.) to 90° F. (32° C.) when the residence time is in the range of 0.5 hours to about 10 hours thereby producing a thermoplastic, water soluble, resorcinolic or resorcinolic and phenolic aldehyde resin mixture with improved flexibility and with toughness, since it has a substantial amount of trimer and dimer polymers without any higher oligomers and has only slight cross-linking and is capable of further reaction.

4,393,190

CARBONATE COPOLYMERS PREPARED FROM IMIDE REACTANTS

John A. Tyrell, and Gary L. Freimiller, both of Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Sep. 21, 1981, Ser. No. 303,998

Int. Cl.³ C08G 63/62, 63/68, 73/10, 73/16

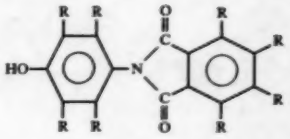
U.S. Cl. 528—170 **22 Claims**

1. An endcapped polymer composition comprised of the reaction product of:

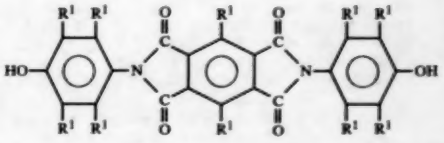
(i) a dihydric phenol;

(ii) a carbonate precursor; and

(iii) at least one imide selected from the group consisting of imides in chain terminating effective amount represented by the general formula



and imides in quantities of from about 1 to about 85 mole percent based on the amount of dihydric phenol represented by the general formula



wherein each R is independently selected from hydrogen, alkyl radicals, alkoxy radicals, and halogen radicals, and wherein each R^1 is independently selected from hydrogen, alkyl radicals, alkoxy radicals, and halogen radicals with the proviso that at least one imide compound of the first formula is employed.

4,393,191

PREPARATION OF AROMATIC POLYESTERS BY DIRECT SELF-CONDENSATION OF AROMATIC HYDROXY ACIDS

Anthony J. East, Madison, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,992

Int. Cl.³ C08G 63/10

U.S. Cl. 528—207 **11 Claims**

1. A process for preparing a wholly aromatic polyester comprising reacting at least one hydroxynaphthoic acid employed in an amount ranging from about 10 to 90 mole percent and at least one hydroxybenzoic acid in an amount from about

10 to 90 mole percent in the presence of a catalytic amount of a metallic compound selected from the group consisting of a Group IV or V metal salt, oxide and organometallic derivative under polymerization reaction conditions.

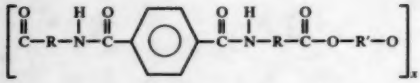
4,393,192

CRYSTALLINE COPOLYMERS PREPARED FROM N,N'-TEREPHTHALOYLDI-BETA-ALANINE AND A GLYCOL

Benedict S. Curatolo, Maple Heights, and Gerald P. Coffey, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 21, 1982, Ser. No. 451,998
Int. Cl.³ C08G *69/08, 69/44*
U.S. Cl. 528—292 **18 Claims**

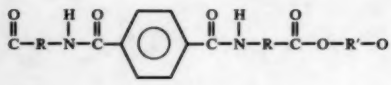
1. Novel water insoluble polyamide esters of the general formula:



$$[\ R'{-}O\ ]_{(100-x0}$$

where each R and R' independently are a divalent aliphatic, alicyclic or aromatic radical;

x is a number of 0 to 100 and represents the percentage of the polyamide ester chain structure containing the following unit:



4,393,193

PROCESS FOR PRODUCING MOLDED ARTICLES FROM POLYLACTAMS BY ACTIVATED ANIONIC POLYMERIZATION OF MEDIUM LACTAMS

Werner Hartmann, Immenstaad, Fed. Rep. of Germany, assignor to Harwe AG, Zurich, Switzerland

Continuation of Ser. No. 811,057, Jun. 29, 1977, Pat. No. 4,233,433, which is a continuation-in-part of Ser. No. 579,620, May 21, 1975, abandoned. This application Sep. 15, 1980, Ser. No. 187,152
The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.
Int. Cl.³ C08G *69/18*
U.S. Cl. 528—326 **1 Claim**

1. A homogeneous molded polylauric lactam article free of bubble formations and shrink holes and which does not show a melting point and disintegrates into crumbs when heated to a temperature from approximately 220° C. to 280° C. prepared by a process involving activated anionic polymerization and which comprises:

(a) adding to a first lactam melt contained in a first vessel at least one polymerization catalyst for the lactam with agitation and maintaining the mixture of the lactam melt and added catalyst under agitation and protected by an inert gas at a first temperature in the range from about 167.5° C. and about 169.5° C., and at a temperature deviation tolerance of about ±1° C. for said first temperature;

(b) adding, following the addition of the catalyst to the first lactam melt, at least one activator for the polymerization of the lactam to a second lactam melt under agitation and maintaining the mixture of the second lactam melt and activator stirred and protected by an inert gas at a second temperature which is lower than the temperature of the first melt and within a temperature range of from about 164° C., and about 166° C., and at a temperature deviation tolerance of about ±1° C. for said second temperature;

(c) pumping the first and second melts at about the melt temperatures by respective first and second gear pumps to a mixing zone through respective first and second essentially straight conveyor tube systems, each respectively at substantially the same temperature as said first and second melts and having an angle of incline to the horizontal plane of a maximum of about 10°, each conveyor tube having a volume at least one-third greater than the volume-conveying capacity of the gear pump to which said tube is coupled;

(d) combining and mixing the melts in a mixing zone maintaining between about 170° C. and about 175° C. to initiate a polymerization reaction;

(e) injecting the melt from the mixing zone into a mold for the molded article to form the article with attendant release of gas; and

(f) returning at least part of the released gas to at least one of the mixing vessels by the conveyor tube systems.

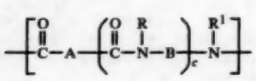
4,393,194

SUBSTITUTED-QUATERPHENYLENE POLYAMIDE

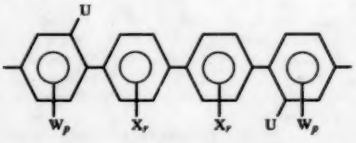
Russell A. Gaudiana, Merrimack, N.H., and Palaiyur S. Kalyanaraman, Chalfont, Pa., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 2, 1981, Ser. No. 239,180
Int. Cl.³ C08G *69/32*
U.S. Cl. 528—348 **57 Claims**

1. A rigid rod-like film- or fiber-forming polymer comprising recurring units of the formula



wherein A is a divalent radical and B is a divalent radical or B represents a single bond; R and R^1 are each hydrogen, alkyl, aryl, alkaryl or aralkyl; and c is zero or one; and wherein, when c is one, at least one of A and B is a divalent substituted-quaterphenylene radical having the formula:



where each U is a substituent other than hydrogen, each W is hydrogen or a substituent other than hydrogen, each p is an integer from 1 to 3, each X is hydrogen or a substituent other than hydrogen and each r is an integer from 1 to 4, said U, W_p and X_r substitution being sufficient to provide the aromatic nuclei of said radical with a non-coplanar molecular configuration with respect to each other; and wherein, when c is zero, A is a divalent substituted-quaterphenylene radical having the aforesaid formula.

4,393,195

CURABLE CYANATE ESTER/ACRYLIC EPOXY ESTER COMPOSITION

Morio Gaku, Showamachi; Nobuyuki Ikeguchi, Tokyo, and Satoshi Ayano, Ninomiya, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,510
Claims priority, application Japan, Aug. 8, 1979, 54-100929
Int. Cl.³ C08G 83/00, 73/12
U.S. Cl. 528—361 8 Claims

1. A curable resin composition consisting essentially of

(a) at least one cyanate ester compound selected from the group consisting of:

(1) a polyfunctional aromatic cyanate ester monomer having the formula:

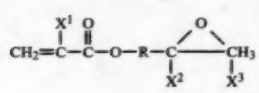
$$R\{-O-C\equiv N)_m$$

wherein m is 2 to 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(2) a homoprepolymer of one or more polyfunction aromatic cyanate ester monomers of (1), and

(3) a coprepolymer of (1) and an amine; and

(b) at least one compound, said compound being selected from the group consisting of acrylic epoxy esters and methacrylic epoxy esters represented by the formula:



(I)

wherein X^1 is hydrogen or methyl, each of X^2 and X^3 is hydrogen, methyl or ethyl, or when together X^2 and X^3 represent alkylene having 3–5 carbon atoms, R is hydrocarbon or substituted hydrocarbon having 1–16 carbon atoms, homoprepolymers of one or more acrylic epoxy esters, homoprepolymers of one or more methacrylic epoxy esters, coprepolymers of acrylic epoxy esters and methacrylic epoxy esters and mixtures thereof; said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product.

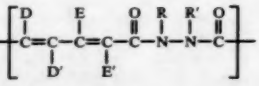
4,393,196

POLYMERS CONTAINING RECURRING UNITS FROM DIENOIC ACID

Howard G. Rogers, Weston, Mass.; Russell A. Gaudiana, Merrimack, N.H.; Jeannette S. Manello, Lawrenceville, N.J., and Ronald A. Sahatjian, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 2, 1981, Ser. No. 238,057
Int. Cl.³ C08G 69/26, 73/08
U.S. Cl. 528—363 13 Claims

1. A film- or fiber-forming polymer comprising recurring units of the formula



wherein each of D, D′, E and E′ is hydrogen, alkyl or substituted-alkyl and each of R and R′ is hydrogen, alkyl, aryl, alkaryl or aralkyl.

4,393,197

ARYLENE SULFIDE POLYMER PREPARATION

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1982, Ser. No. 349,276
Int. Cl.³ C08G 75/14
U.S. Cl. 528—388 10 Claims

1. A method for producing polymers comprising:

(a) contacting at polymerization conditions a reaction mixture consisting essentially of:

(1) at least one polyhalo-substituted aromatic compound,

(2) at least one organic amide,

(3) at least one alkali metal carbonate,

(4) H_2S, and

(5) water in an amount up to 5 weight percent of the total of the other reaction mixture components, and

(b) maintaining said reaction mixture at polymerization conditions for a time sufficient to produce polymer.

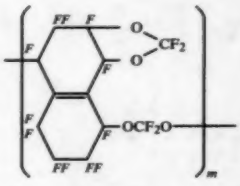
4,393,198

COPOLYMERS FROM OCTAFLUORONAPHTHALENE

Madeline S. Toy, Palo Alto, and Roger S. Stringham, Woodside, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 182,562, Aug. 29, 1980, Pat. No. 4,321,359. This application Sep. 30, 1981, Ser. No. 307,347
Int. Cl.³ C08G 65/00
U.S. Cl. 528—397 2 Claims

1. As a compound, the copolymer having the formula



wherein n is an integer of from 2 to 30.

4,393,199

CATIONIC POLYMERIZATION

Gerald E. Manser, Cupertino, Calif., assignor to S R I International, Menlo Park, Calif.

Filed May 12, 1981, Ser. No. 262,935
Int. Cl.³ C08G 65/10, 65/18, 65/20; C07C 43/11
U.S. Cl. 528—408 8 Claims

1. A method of polymerizing a monomer which is capable of cationic polymerization which comprises:

(a) providing a monomer capable of cationic polymerization

(b) providing a preinitiator precursor and a catalyst, the catalyst being effective to cause cationic polymerization of monomers, the preinitiator precursor being such that it will form an adduct with the catalyst which in turn will form an initiating species with the monomer which will undergo chain extension with a further quantity of the monomer,

(c) forming a mixture of the catalyst and preinitator precursor or separately forming an adduct of the catalyst and preinitiator precursor,

(d) bringing such mixture or preformed adduct into contact with a quantity of the monomer in the proportion of one mol of adduct to n mols of monomer, n being a relatively small number, the quantity of adduct considerably exceeding the quantity required for catalysis, and

(e) causing polymerization to proceed to substantial completion, thereby producing a polymer of low polydispersity consisting predominantly of n mer units derived from the

monomer and one unit derived from the preinitiator precursor.

4,393,200

18 α-GLYCYRRHIZINIC ACID AND SALT THEREOF

Akira Miyashita, Yokohama; Kenzo Okada, Tokyo, and Takashi Kuramoto, Onomichi, all of Japan, assignors to Maruzen Kasei Kabushiki Kaisha, Japan

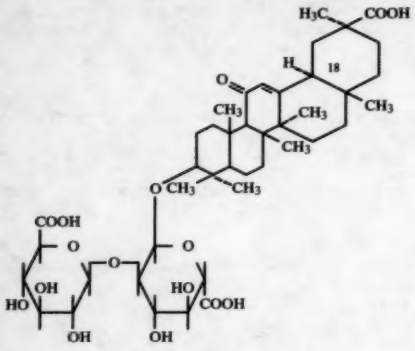
Filed Jan. 6, 1981, Ser. No. 222,880

Claims priority, application Japan, Jan. 9, 1980, 55/580; Feb. 29, 1980, 55/24023

Int. Cl.³ C07H *15/20*

U.S. Cl. 536—18.1 4 Claims

1. 18 α-glycyrrhizinic acid having the structural formula,



and salts thereof.

4,393,201

DNA WHICH CODES FOR GLYCOPROTEIN OF ERA-STRAIN RABIES VIRUS

Peter J. Curtis, Berwyn, and William H. Wunner, Devon, both of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Filed Nov. 4, 1981, Ser. No. 318,315

Int. Cl.³ C07H *21/04;* A61K *39/205*

U.S. Cl. 536—27 1 Claim

1. The single strand DNA that codes for the glycoprotein of ERA-strain rabies virus beginning with an initiation codon (ATG) and ending with a termination codon (TGA), and having the nucleotide sequence as follows: ATG GTT CCT CAG GCT CTC CTG TTT GTA CCC CTT CTG GTT TTT CCA TTG TGT TTT GGG AAA TTC CCT ATT TAC ACG ATA CTA GAC AAG CTT GGT CCC TGG AGC CCG ATT GAC ATA CAT CAC CTC AGC TGC CCA AAC AAT TTG GTA GTG GAG GAC GAA GGA TGC ACC AAC CTG TCA GGG TTC TCC TAC ATG GAA CTT AAA GTT GGA TAC ATC TTA GCC ATA AAA ATG AAC GGG TTC ACT TGC ACA GGC GTT GTG ACG GAG GCT GAA ACC TAC ACT AAC TTC GTT GGT TAT GTC ACA ACC ACG TTC AAA AGA AAG CAT TTC CGC CCA ACA CCA GAT GCA TGT AGA GCC GCG TAC AAC TGG AAG ATG GCC GGT GAC CCC AGA TAT GAA GAG TCT CTA CAC AAT CCG TAC CCT GAC TAC CGC TGG CTT CGA ACT GTA AAA ACC ACC AAG GAG TCT CTC GTT ATC ATA TCT CCA AGT GTA GCA GAT TTG GAC CCA TAT GAC AGA TCC CTT CAC TCG AGG GTC TTC CCT AGC GGG AAG TGC TCA GGA GTA GCG GTG TCT TCT ACC TAC TGC TCC ACT AAC CAC GAT TAC ACC ATT TGG ATG CCC GAG AAT CCG AGA CTA GGG ATG TCT TGT GAC ATT TTT ACC AAT AGT AGA GGG AAG AGA GCA TCC AAA GGG AGT GAG ACT TGC GGC TTT GTA GAT GAA AGA GGC CTA TAT AAG TCT TTA AAA GGA GCA TGC AAA CTC AAG TTA TGT GGA GTT CTA GGA CTT AGA CTT ATG GAT GGA ACA TGG GTC GCG ATG CAA ACA TCA AAT GAA ACC AAA TGG TGC CCT CCC GAT CAG TTG GTG AAC CTG CAC GAC TTT CGC TCA GAC GAA ATT GAG CAC CTT GTT GTA GAG GAG TTG GTC AGG AAG AGA GAG GAG TGT CTG GAT GCA CTA GAG TCC ATC ATG ACA ACC AAG TCA GTG AGT TTC AGA CGT CTC AGT CAT TTA AGA AAA CTT GTC CCT GGG TTT GGA AAA GCA TAT ACC ATA TTC AAC AAG ACC TTG ATG GAA GCC GAT GCT CAC TAC AAG TCA GTC AGA ACT TGG AAT GAG ATC CTC CCT TCA AAA GGG TGT TTA AGA GTT GGG GGG AGG TGT CAT CCT CAT GTG AAC GGG GTG TTT TTC AAT GGT ATA ATA TTA GGA CCT GAC GGC AAT GTC TTA ATC CCA GAG ATG CAA TCA TCC CTC CTC CAG CAA CAT ATG GAG TTG TTG GAA TCC TCG GTT ATC CCC CTT GTG CAC CCC CTG GCA GAC CCG TCT ACC GTT TTC AAG GAC GGT GAC GAG GCT GAG GAT TTT GTT GAA GTT CAC CTT CCC GAT GTG CAC AAT CAG GTC TCA GGA GTT GAC TTG GGT CTC CCG AAC TGG GGG AAG TAT GTA TTA CTG AGT GCA GGG GCC CTG ACT GCC TTG ATG TTG ATA ATT TTC CTG ATG ACA TGT TGT AGA AGA GTC AAT CGA TCA GAA CCT ACG CAA CAC AAT CTC AGA GGG ACA GGG AGG GAG GTG TCA GTC ACT CCC CAA AGC GGG AAG ATC ATA TCT TCA TGG GAA TCA CAC AAG AGT GGG GGT GAG ACC AGA CTG TGA.

4,393,202

METHOD FOR DEWATERING STARCH SLURRIES CONTAINING SWOLLEN STARCH GRANULES RESULTING FROM TREATMENT WITH CATIONIC REAGENTS

William F. Breuninger, Greenwood, Ind., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 17, 1982, Ser. No. 408,987

Int. Cl.³ C08B *31/00, 31/02, 31/08*

U.S. Cl. 536—102 6 Claims

1. In a process for dewatering starch conversion products containing swollen starch granules resulting from treatment with cationic reagents, the improvement which comprises adding to the starch slurry a water soluble anionic polymer, thereby increasing the production rate and yield while reducing suspended solids in the effluent.

4,393,203

PROCESS OF PREPARING ALKYLPOLYSACCHARIDES

Mark H. K. Mao, Cincinnati; Larry E. Miller, Madeira, and John M. Weeman, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 26, 1982, Ser. No. 371,693

Int. Cl.³ C07G *3/00;* C07H *1/00;* C08B *37/00*

U.S. Cl. 536—124 5 Claims

1. In the process of removing fatty alcohol containing from about 12 to about 18 carbon atoms from a mixture of said alcohol with an alkyl polysaccharide wherein saccharide chain length is greater than one on the average and less than about 20 the improvement of heating the mixture under vacuum in a thin film evaporator wherein the thin film evaporator provides, in operation, a Reynolds number of at least about 20,000 and a film thickness of less than about 10 mm and the temperature is from about 120° C. to about 200° C. and the vacuum is from about 0.1 to about 20 mm of mercury so that no more than about 2% of said fatty alcohol remains.

4,393,204

3-[[5-(4-CHLOROPHENYL)FURFURYLIDENE]AMINO]-5-(SUBSTITUTED)-2-OXAZOLIDINONES

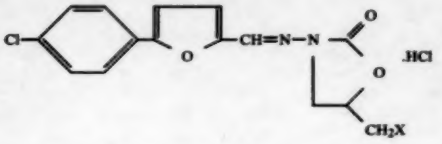
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed May 21, 1982, Ser. No. 380,823

Int. Cl.³ C07D *413/12*

U.S. Cl. 542—420 3 Claims

1. A compound of the formula:



wherein X represents 4-morpholinyl or 1-pyrrolidinyl.

4,393,205

CEPHAPIRINE ESTERS AND SALTS THEREOF

Marco Falciani, and Renato Broggi, both of Milan, Italy, assignors to Dobfar S.p.A., Milan, Italy

Filed Mar. 5, 1981, Ser. No. 240,945

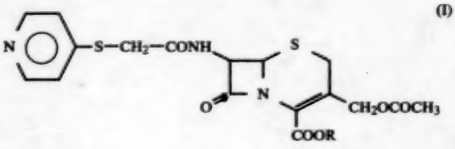
Claims priority, application Italy, Mar. 14, 1980, 20666 A/80

Int. Cl.³ C07D *501/34*

U.S. Cl. 544—28 3 Claims

1. Cephapirine esters having the formula

(I)



wherein R is

$-CH_2OCOC(CH_3)_3$.

4,393,206

PROCESS FOR THE PRODUCTION OF 2,3-DIHYDRO-4H-1,4-BENZOTHIAZINES

Paul Uhrhan, Odenthal, and Edmund Krauthausen, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,221

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111487

Int. Cl.³ C07D *279/16*

U.S. Cl. 544—51 6 Claims

1. A process for the production of 2,3-dihydro-4H-1,4-benzothiazines, characterised in that 2-(2-hydroxyalkyl)-thioanilines are cyclised using phosphorous acid with the release of water.

4,393,207

ALKOXYALKYLAMINOTRIAZINE TRANS-ETHERIFICATION PRODUCTS

Rainer Hummerich, Ludwigshafen; Wolfram Weiss, Mutterstadt; Franz Merger, Frankenthal; Guenther Immel, Weinheim; Hans-Joachim Kraus, Ludwigshafen, and Karl-Clemens Peters, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,586

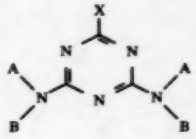
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025352

Int. Cl.³ C07D *251/70, 251/18*

U.S. Cl. 544—196 5 Claims

1. An alkoxyalkylaminotriazine trans-etherification product suitable for use in baking finishes or acid-hardening finishes, which is obtained by reacting an alkoxyalkylaminotriazine of the formula (I)

(I)

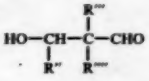


where X is hydrogen, alkyl of 1 to 15 carbon atoms, phenyl, alkylphenyl, where alkyl is of 1 to 4 carbon atoms, or

A and B are identical or different and each is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 15 carbon atoms or

and R and R′ are identical or different and each is hydrogen or alkyl of 1 to 9 carbon atoms, with from 0.1 to 6 moles, per mole of alkoxyalkylaminotriazine, of a β-hydroxyaldehyde of the general formula (II)

(II)



where R″, R‴ and R⁗ are identical or different and each is hydrogen or alkyl of 1 to 5 carbon atoms or R‴ and R⁗ together with the α-carbon atom form a cyclopentane or cyclohexane ring, and R‴ or R⁗ can also be hydroxyalkyl of 1 to 4 carbon atoms and R⁗ can also be phenyl, in the presence of an acidic catalyst, and removing the alcohol resulting from the trans-etherification.

4,393,208

5-METHYL-2-TRIFLUOROMETHYLINDOLO[2,3-b]QUINOXALINE

Robert J. Alaimo, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,899

Int. Cl.³ C07D *487/04;* A61K *31/495*

U.S. Cl. 544—343 1 Claim

1. The compound 5-methyl-2-trifluoromethylindolo[2,3-b]quinoxaline.

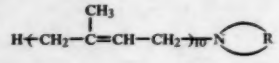
4,393,209

DECAPRENYLAMINE DERIVATIVES

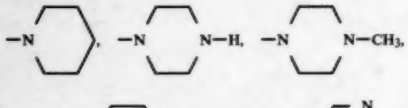
Yoshiyuki Tahara, Ohi; Hiroyasu Koyama, Ageo; Yasuhiro Komatsu, Niiza; Reiko Kubota, Tokyo, and Toshihiro Takahashi, Ohi, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

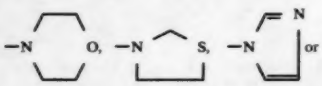
Filed Nov. 19, 1980, Ser. No. 208,326
Claims priority, application Japan, Nov. 19, 1979, 54/148822
Int. Cl.³ C07D *211/06, 295/02, 239/20, 277/22*
U.S. Cl. 544—404 4 Claims

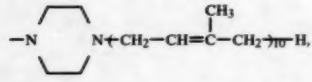
1. A compound of the general formula



wherein R, taken together with the nitrogen atom to which it is attached, is







and the acid addition salts thereof.

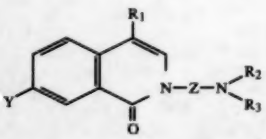
4,393,210

1(2H)-ISOQUINOLONE COMPOUNDS AND ACID ADDITION SALTS THEREOF

Shigeo Senda, Gifu; Eiichi Katho, Aza-nishimachi; Osamu Ohtani, Minokamo; Hidekazu Miyake, and Khosuke Fujiwara, both of Tokushima, all of Japan, assignors to Seiyaku Co., Ltd., Aichi and Taiho Pharmaceutical Co., Ltd., Tokyo, both of, Japan

Filed Aug. 28, 1980, Ser. No. 182,188
Int. Cl.³ C07D *217/14;* A61K *31/47*
U.S. Cl. 546—141 5 Claims

1. 1(2H)-Isoquinolone compounds represented by the formula (I)



(I)

wherein Y represents hydrogen, chlorine or a methoxy group, Z represents a straight chain or branched chain divalent saturated aliphatic hydrocarbon group having 2 to 4 carbon atoms, R_1 represents a cyano group, a lower alkoxycarbonyl group, a carbamoyl group, N-alkylcarbamoyl having 1 to 4 carbon atoms in the alkyl moiety, N,N-dialkylcarbamoyl having 1 to 4 carbon atoms in each alkyl moiety, 4-methylpiperazinocarbonyl or morpholinocarbonyl, a phenyl group or halophenyl or alkoxyphenyl having 1 to 4 carbon atoms in the alkoxy moiety, R_2 represents hydrogen or a lower alkyl group, R_3 represents a lower alkyl group, or R_2 and R_3 can form, when taken together with nitrogen atom to which they are attached, pyrrolidino, piperidino, 4-methylpiperazino, 4-hydroxyethylpiperazino or morpholino, and the pharmaceutically acceptable acid addition salts thereof.

4,393,211

PREPARATION OF AROMATIC SULFOHALIDES

Peter Tonne, Neustadt, and Hagen Jaedicke, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,334
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107700
Int. Cl.³ C07D *215/36;* C07C *143/70*
U.S. Cl. 546—153 10 Claims

1. A process for the preparation of an aromatic sulfohalide by reacting an aqueous solution, containing a hydrogen halide, of an aromatic diazonium halide with sulfur dioxide, which process comprises:

(a) reacting

(1) an aqueous solution which does not dissolve sulfur dioxide, said solution essentially containing the hydrogen halide HX of a diazonium salt which is derived from the corresponding aromatic amine and the halogen X of the desired sulfohalide, with

(2) sulfur dioxide in the presence of an inert organic solvent which dissolves the sulfur dioxide but which is immiscible or only partially miscible with water;

(b) decomposing the diazonium salt, simultaneously or subsequently, by means of a catalyst for diazonium salt decomposition; and

(c) treating the resulting reaction mixture, or the organic phase thereof after removal of the aqueous phase, with an oxidizing agent.

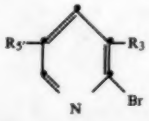
4,393,212

CERTAIN NICOTINIC ACID ESTERS AND CORRESPONDING NICOTINONITRILES

John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 7,092, Jan. 29, 1979, Pat. No. 4,279,913, which is a continuation-in-part of Ser. No. 866,961, Jan. 4, 1978, abandoned. This application May 13, 1981, Ser. No. 263,335
Int. Cl.³ C07D *213/55*
U.S. Cl. 546—286 2 Claims

1. A compound of the formula



wherein R_3 is $COOC_2H_5$ or CN and $R_{5'}$ is CH_2Br, $CHBr_2$ or CBr_3.

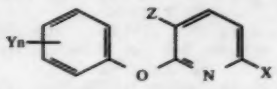
4,393,213

PROCESS FOR PRODUCING 6-PHENOXYPICOLINIC ALDEHYDES

Kiyomi Ozawa, and Shigeru Ishii, both of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Oct. 26, 1981, Ser. No. 315,228
Claims priority, application Japan, Jan. 14, 1981, 56-3224; Jul. 6, 1981, 56-105294
Int. Cl.³ C07D *213/64*
U.S. Cl. 546—298 16 Claims

1. A process for producing 6-phenoxypicolinic aldehydes, which comprises reacting a 2-halogeno-6-phenoxypyridine represented by the general formula I:



I

where X is a halogen atom, Y is independently an alkyl group of 1 to 4 carbon atoms, an alkoxyl group of 1 to 4 carbon atoms, an alkoxyl group of 1 to 4 carbon atoms substituted by a halogen atom, an alkylthio group of 1 to 4 carbon atoms, a trifluoromethyl group, a fluorine atom or a chlorine atom, Z is a hydrogen atom or a fluorine atom, said magnesium metal being in an amount of from 1 to 2 equivalents to said 2-halogeno-6-phenoxypyridine, and n is an integer of 0 to 2, with magnesium metal, and then with a formylating reagent.

4,393,214

PREPARATION OF 2-CHLORO-5-TRIFLUOROMETHYLPYRIDINE AND 2-CHLORO-5-PERCHLOROFLUOROMETHYLPYRIDINES

Norman L. Roberts, Walton, and Graham Whitaker, Frodsham, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 143,479, Apr. 22, 1980, Pat. No. 4,288,600, which is a continuation-in-part of Ser. No. 95,678, Nov. 19, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,428

Claims priority, application United Kingdom, Dec. 7, 1978, 47583/78

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—345 **4 Claims**

1. A process for the preparation of 2,6-dichloro-3-trifluoromethylpyridine which consists essentially of vaporizing 3-trifluoromethylpyridine and chlorinating the vaporized 3-trifluoromethylpyridine by contacting the same in the vapour phase with gaseous chlorine at a temperature in the range from 400° C. to 500° C. using at least one mole of chlorine per mole of 3-trifluoromethylpyridine.

4,393,215

CLEAVAGE OF DIALKOXYKETOXIME

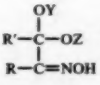
Milorad M. Rogic, Whippany, and Bryce C. Oxenrider, Florham Park, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 6, 1981, Ser. No. 280,754

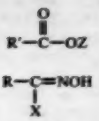
Int. Cl.³ C07D *271/08*

U.S. Cl. 548—125 **6 Claims**

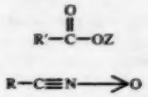
1. A process of cleaving a dialkoxyketoxime which comprises reacting in the liquid phase a dialkoxyketoxime of the formula:



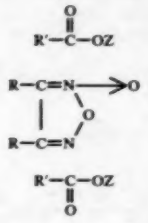
wherein Y and Z are each independently linear or branched alkyl and R and R′ are each independently linear or branched alkyl or are together —$(CH_2)_n$— where n is an integer from 3 to 10, with a halogen selected from elemental chlorine and elemental bromine in the presence of a base and at least an equimolar amount of water under conditions forming a product selected from the group consisting of an oximinohalide of the formula:



where R, R′ and Z′ are as defined above and X is Cl or Br; a nitrile oxide of the formula:



a furoxan of the formula:



and mixtures thereof.

4,393,216

METHOD OF PRODUCING AMINOBENZIMIDAZOLONES

Tsuneaki Hirashima; Toshiyuki Miyata, both of Sakai; Yoshikazu Yamamoto, Ikeda, and Mitsuyuki Kato, Neyagawa, all of Japan, assignors to Showa Chemical Co., Ltd. and Osaka Municipal Government, both of, Japan

Filed Jun. 22, 1981, Ser. No. 275,619

Claims priority, application Japan, Dec. 30, 1980, 55-187383

Int. Cl.³ C07D *235/26*

U.S. Cl. 548—305 **13 Claims**

1. A method of producing 5-aminobenzimidazolones which comprises reacting a 2,4-dinitroaniline with carbon monoxide in a solvent in the presence of selenium, a base selected from the group consisting of tertiary amines, N,N-dialkylamides and inorganic bases selected from the group consisting of hydroxides, oxides, carbonates, bicarbonates and sulfides or alkali metals and alkaline earth metals, and water, said 2,4-dinitroaniline containing no additional substituents or only containing substituents which are substantially inert in the reaction.

4,393,217

SUBSTITUTED PHENYL-5-AMINOPYRAZOLES

John P. Dusza, and Jay D. Albright, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 12, 1981, Ser. No. 224,606

Int. Cl.³ C07D *231/38*

U.S. Cl. 548—362 **3 Claims**

1. The compound 5-amino-N-benzyl-1-methyl-4-pyrazolecarboxamide.

4,393,218

2,2,4,5,5-PENTAMETHYL-3-FORMYL-Δ^3-PYRROLINE AND THE PREPARATION THEREOF

Silvestro Costanzi, S. Guiliano Mi; Francesco Tessarolo, Monza, and Maurizio Brunelli, Milan, all of Italy, assignors to Anic, S.p.A., Palermo, Italy

Continuation-in-part of Ser. No. 149,511, May 13, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 327,753
Claims priority, application Italy, May 29, 1979, 23080 A/79
Int. Cl.³ C07D *207/24*
U.S. Cl. 548—530 3 Claims

1. The compound, 2,2,4,5,5-pentamethyl-3-formyl-Δ^3-pyrroline.

2. A process for the preparation of the compound of claim 1 which comprises reacting di-tert-propargylamine at a pH equal to or less than 3 in an environment comprising from 60 to 65% of sulfuric acid, based on the total solution, at a temperature of between 120° and 135° C.

3. A process for the preparation of the compound of claim 1 which comprises reacting di-tert-propargylamine at a pH equal to or less than 3 in an environment comprising between 45 and 50% of sulfuric acid and between 0.6 and 0.7% of mercury oxide, based on the total solution, at a temperature between 100° and 115° C.

4,393,219

SALT OF CHLORHEXIDINE

Koji Inoue, Osaka; Nobukatsu Sato, Nara, and Takashi Tamura, Takatsuki, all of Japan, assignors to Maruishi Pharmaceutical Co., Ltd., Japan

Filed Sep. 11, 1981, Ser. No. 301,892
Claims priority, application Japan, Mar. 30, 1981, 56-47043
Int. Cl.³ C07D *207/28*
U.S. Cl. 548—534 1 Claim

1. Chlorhexidine-di-2-pyrrolidone-5-carboxylate.

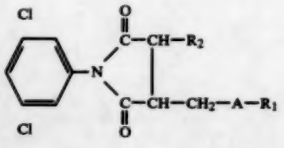
4,393,220

2-ALKENYL AND 2-ALKYNYL SUCCINIC ACID N-(3,5-DICHLOROPHENYL)IMIDES

Norman Häberle, Munich; Otto Eberle, Ottobrunn, and Walter Hafner, Furth, all of Fed. Rep. of Germany, assignors to Consortium für elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,323
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013566
Int. Cl.³ A01N *37/32*; C07D *207/40*
U.S. Cl. 548—545 2 Claims

1. A compound of the formula



in which
A denotes the —CH=CH— or —C≡C— group and
R_1 and R_2 represent hydrogen or methyl.

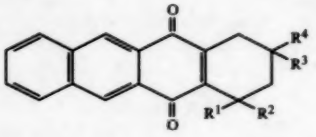
4,393,221

PROCESS TO PRODUCE HEXAHYDRONAPHTHACENE DERIVATIVES

Michael J. Broadhurst, Baldock; Cedric H. Hassall, Welwyn, and Gareth J. Thomas, Luton, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

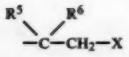
Division of Ser. No. 111,348, Jan. 11, 1980, Pat. No. 4,316,985. This application Nov. 4, 1981, Ser. No. 318,172
Claims priority, application United Kingdom, Jan. 16, 1979, 7901537; Jul. 26, 1979, 7926151
Int. Cl.³ C07C *50/22*; C07D *317/72, 339/06*
U.S. Cl. 549—39 3 Claims

1. A process for the manufacture of compounds of the general formula



I

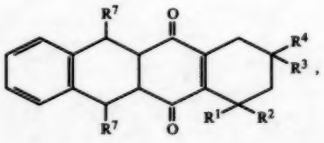
wherein one of R^1 and R^2 represents a hydrogen atom and the other represents a hydroxy group or R^1 and R^2 together represent an ethylene ketal or ethylene thio ketal group, R^3 represents a hydrogen atom or a hydroxy or lower alkanoyloxy group and R^4 represents a lower alkyl or lowr alkoxycarbonyl or benzyloxycarbonyl group or a group of the formula



a

wherein R^5 and R^6 together form an oxo group or an ethylene ketal or ethylene thio ketal group and X represents a hydrogen atom or a hydroxy or lower alkanoyloxy group,
which comprises

(a) eliminating 2 mols of the lower alkane carboxylic acid . R^7H from a compound of the general formula



II

wherein R^1, R^2, R^3 and R^4 have the significance given earlier in this claim and R^7 represents a lower alkanoyloxy group,
by heating or treatment with an alkali metal hydroxide.

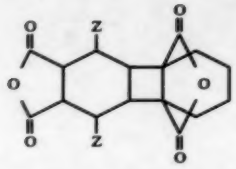
4,393,222

TRICYCLO[6.4.0.0^{2,7}]DODECANE-3,6-DIPHENYL-1,8,4,5-TETRACARBOXYLIC ACID DIANHYDRIDES

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 294,348, Aug. 19, 1981, Pat. No. 4,358,580. This application Jun. 10, 1982, Ser. No. 386,888
Int. Cl.³ C07D *493/04*
U.S. Cl. 549—234 1 Claim

1. As a composition of matter the dianhydrides of the following structure:



wherein Z is either hydrogen or benzene radical.

4,393,223

PROCESS FOR THE PRODUCTION OF MACROCYCLIC ESTERS AND LACTONES UTILIZING MIXED METAL CATALYSTS

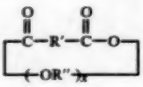
Eugene G. Harris, West Chester, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

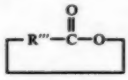
Continuation-in-part of Ser. No. 73,755, Sep. 10, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,727

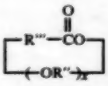
Int. Cl.³ C07D *313/00, 313/18, 321/04, 321/08, 321/12, 321/00, 323/00*

U.S. Cl. 549—266 **8 Claims**

1. A process for the production of macrocyclic compounds having 8 to 20 carbon atoms in the ring and selected from the group consisting of

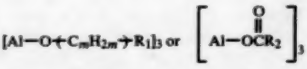






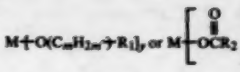
where R′ is a bivalent aliphatic hydrocarbon radical having 1 to 16 carbon atoms, R″ is a saturated bivalent aliphatic hydrocarbon radical having from 2 to 12 carbon atoms, R‴ is a bivalent aliphatic hydrocarbon radical having 6 to 18 carbon atoms and x is an integer from 1 to 4 by thermal depolymerization of the corresponding linear polyester which comprises heating the polyester at a temperature from 200° C. to 400° C. and pressure less than 50 mm Hg. in the presence of 0.01% to 20% by weight, based on the polyester, of a mixed metal catalyst comprising:

(a) an aluminum alkoxide or aluminum carboxylate corresponding to the formula



where m is an integer from 1 to 22, R_1 is hydrogen, an alkoxy or polyalkoxy radical having from 1 to 16 carbon atoms and R_2 is an alkyl group having from 2 to 22 carbon atoms, phenyl or substituted phenyl having 7 to 20 carbon atoms; and

(b) from 0.05 to 8 moles, per mole of (a), of an alkali metal or magnesium alkoxide or carboxylate corresponding to the formula



wherein R_1, R_2 and m are the same as defined above, M is lithium, sodium, potassium or magnesium and y is 1 when M is lithium, sodium or potassium, and 2 when M is magnesium.

4,393,224

TELOMERIZATION OF BUTADIENE AND CARBON DIOXIDE

James A. Daniels, Frodsham, England, assignor to Imperial Chemical Industries Plc., London, England

Filed Oct. 19, 1981, Ser. No. 312,914

Claims priority, application United Kingdom, Oct. 20, 1980, 8033740

Int. Cl.³ C07D *309/32*

U.S. Cl. 549—273 **12 Claims**

1. A process for the manufacture of 2-ethylideneheptt-6-en-5-olide which comprises reacting in a liquid medium 1,3-butadiene with carbon dioxide in the presence of

(a) a palladium complex catalyst which is a complex of palladium with a phosphorus (III) compound or pyridine or a substituted pyridine, and

(b) a tertiary amine having a pKa value in the range 10 to 14.

4,393,225

AI-77 COMPOUNDS AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Hiroshi Hayashi; Yukiji Shimojima; Takashi Shirai; Toruo Ishida, all of Fuji, and Mitsuru Shibukawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

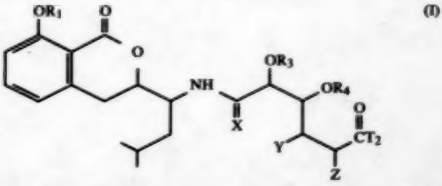
Filed Jul. 11, 1980, Ser. No. 167,581

Claims priority, application Japan, Jul. 11, 1979, 54-86892; May 12, 1980, 55-61685

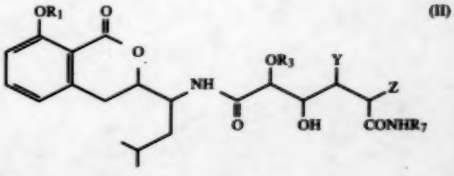
Int. Cl.³ C07D *311/76*

U.S. Cl. 549—289 **5 Claims**

1. An AI-77 compound of the formula (I) or (II):



(I)



(II)

wherein:

X is NR_6 or O;

Y is NHR_5 or combines with Z to provide a link for bonding C and C;

Z is H or combines with Y to provide a link for bonding C and C;

R_1, R_3 and R_5 are each H, R′, $—CH_2R$, or —COR;

R_6 is H or R;

R_7 is H, R or CH_2R;

R is a hydrocarbon group consisting of a straight or branched alkyl group of C_1 to C_{17} containing from 0 to 3 double bonds or triple bonds, an aromatic group of C_6 to C_{10}, a bridged hydrocarbon group of C_7 to C_{10}, a cycloalkyl group of C_3 to C_8 and an arylaliphatic group having a C_6 to C_{10} aromatic group on a C_1 to C_5 aliphatic group, wherein the above hydrocarbons can be substituted with halogen, oxo, carboxyl, hydroxyl, a straight or branched aliphatic group of C_1 to C_5 containing from 0 to 3 double bonds or triple bonds, an aromatic group of C_6 to C_{10}, a cycloalkyl group of C_3 to C_8, an aromatic-aliphatic group of C_7 to C_{11}, alkoxy of C_1 to C_5, thioalkoxyl or C_1 to C_5, carboalkoxy of C_2 to C_6, acyl of C_1 to C_6 or acyloxy of C_2 to C_6;

R' is the same as R exclusive of those groups wherein unsaturated carbon or tertiary carbon is directly bonded to O or N;

R_4 is H or combines with T_2 to provide a link for bonding C and O in a lactone ring; and

T_2 is OH or combines with R_4 to provide a link for bonding C and O in a lactone ring;

or a pharmaceutically acceptable salt thereof with hydrohalogenic acid, phosphoric acid, sulfuric acid, oxalic acid, maleic acid or an organic sulfonic acid.

4,393,226

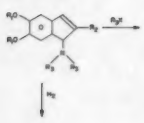
COMPOUNDS AND METHODS FOR CHANGING CALCIUM METABOLISM WITHIN THE CELLS OF A MAMMAL

Donald T. Witiak, Mount Vernon, and Ralf G. Rahwan, Columbus, both of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

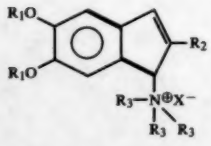
Filed May 6, 1981, Ser. No. 261,008

Int. Cl.³ C07D *317/44;* A61K *31/36*

U.S. Cl. 549—433 **30 Claims**



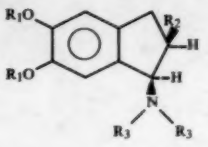
1. A 2-alkyl-5,6-dialkoxyindene-1-trialkylammonium salt of Formula II



II

wherein the two R_1's together form an alkylene group of 1 to 3 carbon atoms, R_2 is an alkyl group of 1 to about 8 carbon atoms, a cycloalkyl group of 3 to about 7 carbon atoms or a phenyl group, each R_3 independently is an alkyl group of 1 to 3 carbon atoms and X^- is an anion.

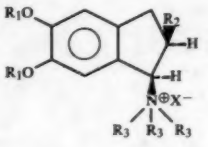
11. A cis 2-alkyl-5,6-dialkoxy-1-dimethylaminoindane of Formula IIIA



IIIA

wherein the two R_1 groups together form an alkylene group of 1 to 3 carbon atoms, R_2 is an alkyl group of 1 to about 8 carbon atoms, a cycloalkyl group of 3 to about 7 carbon atoms or a phenyl group, and each R_3 independently is an alkyl group of 1 to 3 carbon atoms.

21. A cis 2-alkyl-5,6-dialkoxyindane-1-trialkylammonium salt of Formula IVA



IVA

wherein the two R_1 groups together form an alkylene group of 1 to 3 carbon atoms, R_2 is an alkyl group of 1 to about 8 carbon atoms, a cycloalkyl group of 3 to about 7 carbon atoms or a phenyl group, each R_3 independently is an alkyl group of 1 to 3 carbon atoms and X^- is an anion.

4,393,227

PROCESS FOR DECHLORINATING ORGANIC COMPOUNDS

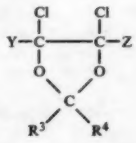
Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1981, Ser. No. 292,060

Int. Cl.³ C07D *317/10*

U.S. Cl. 549—455 **18 Claims**

1. A process for dechlorinating an organic compound selected from the group consisting of



where each of Y and Z independently is hydrogen, chlorine or fluorine, provided at least one of Y and Z is fluorine; and each of R^3 and R^4 independently is hydrogen, fluorine or trifluoromethyl to the ethylenically unsaturated compound,

said process comprising contacting the organic chlorine-containing compound with at least a stoichiometric amount of metallic magnesium, a mercury based promoter selected from water-soluble mercury salts and metallic mercury, and iodine in the presence of tetrahydrofuran at a temperature from about room temperature to at least the boiling point of tetrahydrofuran at the operating pressure;

with a proviso that magnesium amalgam can be used in lieu of magnesium and the mercury-based promoter.

4,393,228

EPOXYSUCCINIC ACID DERIVATIVES

Jiro Sawada, Kodaira; Kazunori Hanada; Masaharu Tamai, both of Ageo; Shigeo Morimoto, Saitama, and Sadafumi Omura, Ageo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

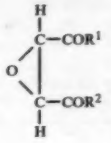
Filed Feb. 22, 1978, Ser. No. 880,180

Claims priority, application Japan, Mar. 3, 1977, 52-23092; Mar. 4, 1977, 52-23536; Mar. 4, 1977, 52-23537

Int. Cl.³ C07D *303/48, 407/12, 411/12, 407/02*

U.S. Cl. 549—549 14 Claims

1. Trans-epoxysuccinic acid derivatives represented by the general formula



wherein

(1) R^1 and R^2 are each R^3 wherein R^3 is —O—A^1—R^4, —O—A^2—R^5 or —OCH_2—R^6 wherein A^1 is alkylene containing zero to 4 carbon atoms or said alkylene substituted with methyl, R^4 is cycloalkyl containing 3 to 10 carbon atoms, or said cycloalkyl substituted with one to 3 halogen or methyl, A^2 is alkylene containing 2 or 3 carbon atoms, or alkenylene containing 2 or 3 carbon atoms, R^5 is phenyl, R^6 is furyl, tetrahydrofuryl, thienyl, naphthyl, naphthyl substituted with one or two halogen or methyl, phenyl substituted with one to three halogen, methyl, methoxy, methylenedioxy or trifluoromethyl, or cycloalkenyl containing 5 to 8 carbon atoms, or

(2) R^1 is hydroxy, R^3 or R^7, and R^2 is hydroxy or R^8 wherein R^3 is as defined above, R^7 is alkoxy containing one to 12 carbon atoms, allyloxy, propargyloxy, phenoxy or benzyloxy, and R^8 is an amino acid residue represented by the general formula

—NH—A^3—COR^9

wherein A^3 is methylene, ethylene, trimethylene, alkylidene containing 2 to 5 carbon atoms or said alkylidene substituted with one to 3 hydroxy, methyl, thiol, methylthio, benzylthio, phenyl, phenyl substituted with hydroxy or halogen, indazolyl, imidazolyl, —COR^{10} or —NHR^{11} wherein R^{10} is amino or —OR^{12} wherein R^{12} is hydrogen, alkyl containing one to 5 carbon atoms, benzyl or an alkali metal cation, and R^{11} is hydrogen, formyl, alkoxycarbonyl containing 2 to 5 carbon atoms, benzyloxycarbonyl, methoxybenzyloxycarbonyl, tosyl, guanyl, or guanyl substituted by nitro, and R^9 is amino or —OR^{13} wherein R^{13} is hydrogen, alkyl containing one to 5 carbon atoms, benzyl or an alkali metal cation, with the proviso that R^1 is neither hydroxy, alkoxy containing one to 12 carbon atoms, nor phenoxy when R^2 is hydroxy, and salts thereof when R^1 or R^2 is hydroxy.

4,393,229

REDISTRIBUTION OF POLYSILANES IN HIGH BOILING RESIDUES

Alan Ritzer, Sand Lake; Abraham L. Hajjar, Scotia; Harry R. McEntee, Waterford, and Ray W. Shade, Clifton Park, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,601

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—430 34 Claims

1. A process for treating alkyl-rich disilane-containing residues, comprising contacting the residue with alkyltrihalosilane or silicon tetrahalide in the presence of a catalyst and a catalytic amount of a hydrosilane reaction promoter at an elevated temperature to produce a redistribution product containing halogen-rich disilanes and dialkyldihalosilane.

4,393,230

METHOD OF PREPARING ETHYL SILICATE

William A. Crocker, Corvallis, and Duane L. Hug, Albany, both of Oreg., assignors to Teledyne Industries, Inc., Albany, Oreg.

Filed Sep. 25, 1981, Ser. No. 305,554

Int. Cl.³ C07F *7/08, 7/18*

U.S. Cl. 556—457 5 Claims

1. A method of continuously producing ethyl silicate, having a predetermined percentage of silica content, in high yields from the reactants silicon tetrachloride, ethanol and water comprising adjusting the flowrate of the reactants to the reactor in relation to fluctuations in the temperature of the reaction in the reactor.

4,393,231

FLUORINE-CONTAINING PHENYL BENZOATE COMPOUNDS, AND THEIR PRODUCTION AND USE

Susumu Misaki, Minoo; Masahiro Suefuji, Settsu; Tamio Mitote, Kawanishi, and Naotake Matsumura, Itami, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

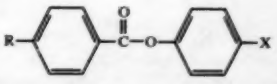
Continuation of Ser. No. 75,686, Sep. 14, 1979, abandoned. This application Sep. 11, 1981, Ser. No. 301,128

Claims priority, application Japan, Sep. 19, 1978, 53/115447; Nov. 21, 1978, 53/144571

Int. Cl.³ C09K *3/34;* C02F *1/13;* C07C *69/635, 121/60, 121/75, 79/12, 79/35*

U.S. Cl. 560—73 1 Claim

1. A fluorine-containing phenyl benzoate compound of the formula:



wherein R is a C_6–C_8 alkoxy group and X is a trifluoromethyl group.

4,393,232

PREPARATION OF 3-BROMO-4-FLUORO-BENZOIC ACID

Fritz Maurer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

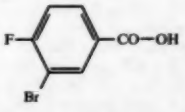
Filed Sep. 2, 1981, Ser. No. 298,827

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035355

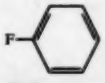
Int. Cl.³ C07C *51/29*

U.S. Cl. 562—419 5 Claims

1. A process for the preparation of 3-bromo-4-fluorobenzoic acid of the formula



comprising reacting fluorobenzene of the formula



with acetyl chloride in the presence of an acylation catalyst at

a temperature from about 0° to 100° C., without isolation reacting the reaction mixture thereby obtained with bromine at a temperature from about 50° to 150° C., separating the resulting bromination product and without purification reacting it with hypochlorite solution at a temperature between about 0° and 100° C.

4,393,233

PREPARATION OF P-(1,1-DIMETHYL-2-HYDROXYETHYL)BENZOIC ACID

Herbert K. Reimschuessel, Morristown, and Bruce T. DeBona, Madison, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 153,361, May 27, 1980, Pat. No. 4,310,655. This application Jan. 7, 1982, Ser. No. 337,900

Int. Cl.³ C07C 65/00

U.S. Cl. 562—473 2 Claims

1. Process for production of (p-1,1-dimethyl-2-hydroxyethyl)benzoic acid comprising the steps:

(a) Brominating isobutyric acid;

(b) Condensing the resulting alpha-bromoisobutyric acid with benzene;

(c) Brominating the resulting dimethylphenylacetic acid;

(d) Reducing the carboxyl group of the brominated acid obtained in step (c) to form p-(1,1-dimethyl-1-hydroxyethyl)bromobenzene;

(e) Replacing the bromine atom in the product obtained in step (d) by the cyano group;

(f) Converting the cyano group in the product of step (e) to the carboxyl group.

4,393,234

PROCESS FOR THE PREPARATION OF 3-HYDROXYBENZOIC ACID

Heinz U. Blank, Odenthal; Eike Gabel, Bergisch-Gladbach; Ernst Goldschmitt, Dormagen, and Werner Mentzel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 378,922

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122260; Jun. 4, 1981, 3122264

Int. Cl.³ C07C 65/04

U.S. Cl. 562—475 28 Claims

1. In a process for the preparation of 3-hydroxybenzoic acid by contacting 3-sulphobenzoic acid with an alkali metal hydroxide at an elevated temperature, the improvement which comprises:

(A) employing a technical 3-sulphobenzoic acid mixture containing sulphuric acid and/or sulphur trioxide, which technical mixture contains at least 75% by weight of 3-sulphobenzoic acid, relative to the total organic constituents present, and not more than 35% by weight of sulphuric acid and/or SO_3, relative to the total mass;

(B) the technical mixture is contacted with mixing at an elevated temperature with sufficient 50 to 100% strength by weight alkali metal hydroxide, the remaining 50 to 0% by weight consisting essentially of water, such that 2.5 to 8 mols of alkali metal hydroxide are present per mol of 3-sulphobenzoic acid, after neutralization of the sulphuric acid and all of the sulpho and carboxyl groups;

(C) the resultant alkaline reaction mixture is reacted at a temperature in the range of 220° to 450° C. under a pressure of 1 to 120 bars; and

(D) the alkaline reaction mixture so obtained is acidified with a mineral acid to a pH value less than 4 and 3-hydroxy benzoic acid is recovered at a temperature in the range of −5° to +40° C.

4,393,235

PROCESS FOR PRODUCING P-HYDROXYPHENYL/ACETIC ACID

Alan Mitchell, Macclesfield, and Thomas Bailey, Bramhall, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 4, 1981, Ser. No. 259,925

Claims priority, application United Kingdom, Jun. 11, 1980, 8019155

Int. Cl.³ C07C 65/01

U.S. Cl. 562—478 5 Claims

1. A process for the manufacture of p-hydroxyphenylacetic acid which comprises reducing p-hydroxymandelic acid with a stannous salt under acidic conditions, the reduction being carried out in aqueous solution in the presence of a mineral acid at a temperature of up to 100° C.

4,393,236

PRODUCTION OF NONHYGROSCOPIC SALTS OF 4-HYDROXYBUTYRIC ACID

Joseph Klosa, Jänickestrasse 13, D-1000 Berlin 37, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,419

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027390; Nov. 20, 1980, 3049869

Int. Cl.³ C07C 59/00

U.S. Cl. 562—579 21 Claims

1. Waterfree calcium-4-hydroxybutyrate of the formula $Ca(COOCH_2CH_2CH_2OH)_2$.

4,393,237

POLYOXYALKYLENEPOLYACRYLAMIDES

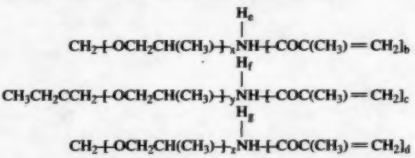
Ernest L. Yeakey, Houston, and Lewis W. Watts, Jr., Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 2, 1981, Ser. No. 279,906

Int. Cl.³ C07C 103/153

U.S. Cl. 564—153 3 Claims

1. A mixture of compounds of the formula



wherein x+y+z has an average value of 3 to 30; b, c, d are 0 or 1; provided, if b=0, e is 1 and conversely e is 0 if b=1; if c=0, f is 1 and conversely f is 0 if c=1; if d=0, g is 1 and conversely g is 0 if d=1; provided, further, at least one of b, c and d must be 1.

4,393,238

METHOD FOR THE PRODUCTION OF BLOCKED ISOCYANATES

Hans-Georg Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

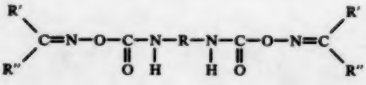
Filed May 18, 1981, Ser. No. 265,321

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019491

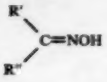
Int. Cl.³ C07C 131/00

U.S. Cl. 564—255 4 Claims

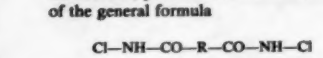
1. Method for the production of blocked isocyanates of the general formula



in which R, R′ and R″ represent an aliphatic, cycloaliphatic or aromatic hydrocarbon group, whereby R′ and R″ can be the same or different, and when R′ is an aromatic group, R″ can also be a hydrogen atom, comprising reacting terephthalic dialdoxime, isophthalic dialdoxime or an aliphatic, cycloaliphatic or aromatic ketoxime or an aromatic aldoxime of the general formula



in the presence of 10–100 Mol% sodium-, potassium- or calcium-hydroxide, relative to the ketoxime or aldoxime used, with the sodium-, potassium- or calcium-salt of a bis-N-chloramide of the general formula



in water or a mixture of water and an aprotic solvent, at temperatures in the range between 20° and 100° C.

4,393,239

PROCESS FOR THE PREPARATION OF POLYARYL AMINES HAVING METHYLENE BRIDGES

Efim Biller, Zürich, Switzerland, assignor to Elprochine AG, Zurich, Switzerland

Continuation of Ser. No. 2,812, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 847,650, Nov. 1, 1977, abandoned. This application Apr. 16, 1980, Ser. No. 140,914

Claims priority, application Switzerland, Nov. 6, 1976, 14012/76

Int. Cl.³ C07C *85/08*

U.S. Cl. 564—331 **4 Claims**

1. In a process for the preparation of polyaryl amines having methylene bridges from arylamines and formaldehyde in the presence of acids wherein 0.25–1.3 mol of formaldehyde per mol of arylamine is added in a first mixing step in the presence of 0.85–1.01 mol of acid, the improvement which comprises adding at least 0.1 mol of free arylamine before the formed compounds of the anhydroformaldehyde aniline type are noticeably rearranged into benzyl anilines, then reacting the reaction mixture at temperatures between 30° and 70° C. to form benzyl anilines and, finally, converting the resulting precondensate at temperatures between 70° and 120° C. into polyamines having methylene bridges.

4,393,240

OPTICALLY ACTIVE PHOSPHINES

John K. Stille, c/o Polymer Sciences Corporation, 330 Madison Ave., New York, N.Y. 10017

Filed Jul. 6, 1981, Ser. No. 280,220

Int. Cl.³ C07F *9/50, 15/00*

U.S. Cl. 568—13 **6 Claims**

1. (R)-1,2-bis(diphenylphosphino)-3-benzyloxypropane.

4,393,241

SYNTHESIS OF ALKOXY AND PHENOXY SUBSTITUTED ARYL SULFIDES

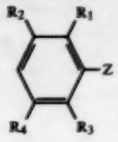
Harry T. Hanson, Millburn, N.J., and John B. Sapp, Jr., Houston, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,337

Int. Cl.³ C07C *149/32*

U.S. Cl. 568—49 **17 Claims**

1. A process for the synthesis of a alkoxy or phenoxy substituted aryl sulfide comprising reacting in the presence of a catalytic amount of an alkali metal tetrafluoroborate catalyst a sulfur dihalide with an aromatic reactant compound of the structural formula



wherein R_1, R_2, R_3 and R_4, which can be the same or different, represent hydrogen or a lower alkyl, and Z is —OR_5 with R_5 representing an alkyl having from 1 to 8 carbon atoms or a phenyl.

4,393,242

PROCESS FOR PREPARING METHYLVANILLYL KETONE FROM ISOEUGENOL

Meyer Sletzinger, North Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 79,748, Sep. 28, 1979, Pat. No. 4,337,360. This application Jul. 6, 1981, Ser. No. 280,623

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.³ C07C *45/52*

U.S. Cl. 568—322 **6 Claims**

1. A through process for preparing methylvanillyl ketone which comprises:

(1) direct oxidation of an unprotected isoeugenol in an aqueous solution of an organic acid to obtain a reaction mixture containing unprotected isoeugenol glycol as an intermediate therein; said organic acid being selected from the group consisting of formic acid, acetic acid, propionic acid, trichloroacetic acid, or trifluoroacetic acid;

(2) heating said reaction mixture at a temperature of about 25°–100° C. with an aqueous solution of a strong acid in an inert solvent; said strong acid being selected from the group consisting of sulfuric acid, alkyl or aryl sulfonic acid, hydrobromic acid, hydrochloric acid, or phosphoric acid; and,

(3) recovering methylvanillyl ketone directly from said acid-treated reaction mixture without isolating said unprotected isoeugenol glycol intermediate.

4,393,243

CAROTENOID INTERMEDIATE BY AN OXIDATION PROCESS

Bruno Lohri, Kaiseraugst, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

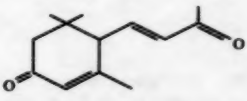
Filed Mar. 17, 1981, Ser. No. 244,574

Int. Cl.³ C07C *45/34*

U.S. Cl. 568—344 **19 Claims**

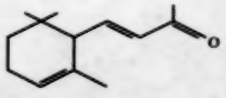
1. A process for the manufacture of 3,5,5-trimethyl-4-[(E)-3-oxo-1-butenyl]-2-cyclohexen-1-one of the formula

I



which process comprises oxidizing α-ionone of the formula

II



in a reaction mixture containing concentrated acetic acid with

oxygen or an oxygen-containing gas in the presence of a cobalt acetate/bromide catalyst.

4,393,244

METHOD AND THE MANUFACTURE OF CYCLIC MONO AND/OR DIKETONES FROM CYCLIC MONO OR SESQUI TERPENES BY CATALYTIC OXIDATION

Sumit Bhaduri, and Madan M. Mahandru, both of Maharashtra, India, assignors to Indian Explosives Limited, Calcutta, India

Filed Aug. 26, 1981, Ser. No. 296,280
Int. Cl.³ C07C *45/34*
U.S. Cl. 568—360 **10 Claims**

1. A process for the preparation of cyclic mono and/or diketones which comprises reacting a cyclic mono or sesquiterpenoid hydrocarbon containing at least one unsubstituted methylene group adjacent to a double bond with oxygen or an oxygen containing gas in the presence of a catalyst selected from the group consisting of compounds of the formulas:

$$M_m(L_2)nX_p(O)_q$$

where

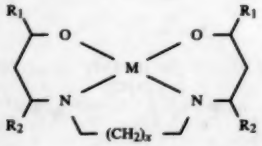
L_2 is 2,2'-bipyridyl or 1,10-orthophenanonthroline, and either

(a) M is Cu, m=2, X is I, Br or Cl, p=2, q=0; or
(b) M is Cu, m=1, n=1, X is NO_2, p=2 and q=0; or
(c) M is Mo, m=1, n=1, X=Br, p=2 and q=2;

$$R''L_3Cl$$

where

L is triphenylphosphine;



where

M is Co, X=2 to 3 and R_1 and R_2 which may be the same or different represent methyl, ethyl, propyl, trifluoromethyl, phenyl or benzyl; and

$$M(O)_m[(R_1CO)CH(COR_2)]_n$$

where

R_1 and R_2 which may be the same or different represent methyl, ethyl, n-propyl, trifluoromethyl, phenyl or benzyl, and

(a) M is V, m=1, n=2, or
(b) M is Mo, m=2, n=2, or
(c) M is Co, m=o, n=2, or
(d) M is Co, m=o, n=2, or
(e) M is Mn, m=o, n=2, or
(f) M is Cu, m=o, n=2, or
(g) M is Rh, m=o, n=3, or
(h) M is Fe, m=o, n=3.

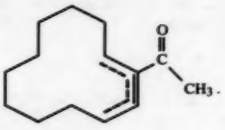
4,393,245

MUSK-LIKE SCENTS AND THEIR MANUFACTURE

Werner Hoffman, Neuhofen; Karl von Fraunberg, Bobenheim, and Manfred Baumann, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 812,153, Jul. 1, 1977, abandoned. This application Dec. 2, 1981, Ser. No. 326,597
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630835
Int. Cl.³ C07C *49/547, 49/307*
U.S. Cl. 568—375 **1 Claim**

1. The compound 1-acetyl-1-cyclododecene having a musk-like scent of the formula



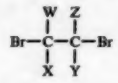
4,393,246

PROCESS FOR BROMINATING SIDE CHAIN OF M-PHENOXYTOLUENE

Masashige Kubo, Tokuyama; Mitsuaki Yoshimitsu, and Kanzi Katsuragawa, both of Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Oct. 29, 1981, Ser. No. 316,448
Claims priority, application Japan, Nov. 21, 1980, 55-163360
Int. Cl.³ C07C *41/22*
U.S. Cl. 568—639 **5 Claims**

1. In a process for brominating a side chain of m-phenoxytoluene with a polyhalogenated ethane having the formula



wherein W and Z respectively represent Cl or Br and X and Y respectively represent Cl, Br or H, as a brominating agent, the improvement consisting of carrying out said bromination in the liquid phase in the presence of an amorphous carbon.

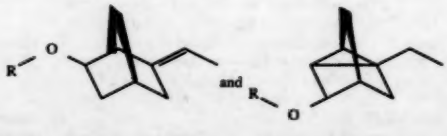
4,393,247

NORBORNYL ETHERS

Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 280,274, Jul. 6, 1981, abandoned, which is a division of Ser. No. 200,012, Oct. 23, 1980, Pat. No. 4,311,861. This application Dec. 29, 1981, Ser. No. 335,561
Int. Cl.³ C07C *43/188*
U.S. Cl. 568—665 **5 Claims**

1. A composition of matter consisting essentially of at least one compound having a structure selected from the group consisting of:



wherein "R" in each of the compounds is the same and represents hydroxy ethyl or methoxy ethyl.

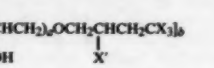
4,393,248

FLAME RETARDED HALOGENATED POLYOL

Stanley R. Sandler, Springfield, and Joseph M. Bohen, King of Prussia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 20, 1981, Ser. No. 294,699
Int. Cl.³ C07C 43/10, 43/12; C08G 18/00, 18/14
U.S. Cl. 568—676 8 Claims

1. A flame retardant polyol of the formula



wherein

a is an integer of 0 or 1, with the proviso that

when a is 0, b is an integer of 1 to 8, R is selected from the group consisting of a substituted linear or branched alkyl of 2 to 12 carbons and a substituted cyclic alkyl of 3 to 12 carbons; X is selected from the group consisting of F, Cl, and Br; and X' is selected from the group consisting of H, F, Cl, and Br; whereby the substituent is selected from the group consisting of at least 1 hydroxyl groups, and

when a is 1, b is an integer of 1 to 8, R is selected from the group consisting of hydrogen, a substituted linear or branched alkyl of 2 to 12 carbons and a substituted cyclic alkyl of 3 to 12 carbons; X is selected from the group consisting of F, Cl, and Br; and X' is selected from the group consisting of H, F, Cl, and Br; whereby the substituent is selected from the group consisting of at least 1 hydroxyl groups.

4,393,249

PROCESS FOR REMOVING ALKYNES FROM C_4 HYDROCARBON MIXTURES

Albert Heuvelsland, Heikant; Fritz F. F. Jann, Terneuzen, both of Netherlands, and Greet de Block-Martens, Stekene, Belgium, assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 23, 1981, Ser. No. 314,288
Int. Cl.³ C07C 41/08, 7/00
U.S. Cl. 568—688 21 Claims

1. A process comprising contacting an alkyne with a C_1–C_4 monohydric alcohol or mixture thereof under reaction conditions to form an ether, said reactive process occurring in the presence of a catalytic amount of a cation-exchange resin having a plurality of pendant sulfonate groups with silver metal counterions.

4,393,250

PROCESS FOR PRODUCING ALCOHOLS AND ETHERS

Klaus Gottlieb, Herdecke-Ende; Hartmut Bruderreck, Gelsenkirchen-Buer, and Friedel-Heinrich Wehmeier, Bottrop-Kirchhellen, all of Fed. Rep. of Germany, assignors to Veba Oel AG, Gelsenkirchen-Buer, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,804
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116779
Int. Cl.³ C07C 41/06, 37/72
U.S. Cl. 568—697 23 Claims

1. A process for producing isopropyl tert-butyl ether from a mixture of light hydrocarbons containing propane and butane comprising:

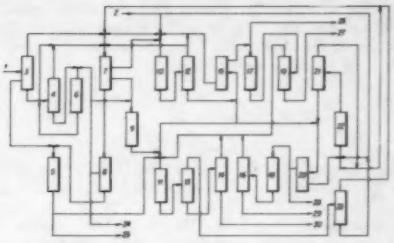
(a) separating from said mixture of light hydrocarbons a propane fraction and a butane fraction containing at least n-butane;

(b) isomerizing at least a portion of said n-butane in said butane fraction from step (a) whereby a hydrocarbon mixture containing at least n-butane and isobutane is formed;

(c) catalytically dehydrogenating said isobutane in said hydrocarbon mixture from step (b) whereby a hydrocarbon mixture containing at least isobutene is produced;

(d) catalytically dehydrogenating said propane in said propane fraction from step (a) whereby a hydrocarbon mixture containing at least propene is produced;

(e) reacting said propene in said hydrocarbon mixture from step (d) with water, whereby a mixture containing hydrocarbons and isopropyl alcohol is formed;



(f) reacting said isopropyl alcohol from step (e) with at least part of said isobutene in said hydrocarbon mixture from step (c) whereby a mixture containing hydrocarbons and isopropyl tert-butyl ether is formed;

(g) recycling said hydrocarbons in said hydrocarbon mixture from step (e) to step (d);

(h) recycling said hydrocarbons in said hydrocarbon mixture from step (f) to step (c); and

(i) recovering at least said isopropyl tert-butyl ether.

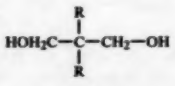
4,393,251

PREPARATION OF PROPANEDIOLS USING A COPPER-AND ZINC CONTAINING HYDROGENATION CATALYST

Franz J. Broecker, Ludwigshafen; Leopold Hupfer, Friedelsheim; Franz Merger, Frankenthal; Ernest Miesen, Ludwigshafen; Juergen Paetsch, Wachenheim, and Guenter Zirker, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

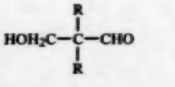
Division of Ser. No. 274,486, Jun. 17, 1981. This application Feb. 10, 1982, Ser. No. 347,380
Int. Cl.³ C07C 31/20, 33/26, 31/27, 41/26
U.S. Cl. 568—811 9 Claims

1. In a process for the preparation of a propanediol of the formula



I

where the R's may be identical or different and each is an aliphatic, araliphatic or aromatic radical, or the two R's together with the adjacent carbon atom are members of an alicyclic ring, by hydrogenating a hydroxypropionaldehyde of the formula



II

where R has the above meanings, in the presence of a copper-containing hydrogenation catalyst, the improvement which comprises:

carrying out the hydrogenation in the liquid phase with a hydrogenation catalyst which has been obtained by pre-

cipitating copper and zinc in a ratio of from 0.6 to 3 atoms of copper per atom of zinc from a solution of their compounds in the presence of a carbonate at a pH of from 6.9 to 8, and decomposing the resulting mixed crystals of the formula

$$Cu_{1.5-3}Zn_{1-2.5}(CO_3)_{1-2}(OH)_{4-6}(H_2O)_{0-1}$$

at from 200° to 500° C., introducing into said catalyst during its preparation at least one metal additive selected from the group consisting of chromium, calcium, magnesium and aluminum in an amount of up to 10 percent by weight, based on the total catalyst.

4,393,252

PROCESS FOR PRODUCING ETHYLENE GLYCOL

John Kollar, Wyckoff, N.J., assignor to Redox Technologies, Inc., Wyckoff, N.J.

Continuation of Ser. No. 286,721, Jul. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 183,537, Sep. 2, 1980, Pat. No. 4,337,371. This application Mar. 26, 1982, Ser. No. 362,433

Int. Cl.³ C07C *31/20*

U.S. Cl. 568—852 **26 Claims**

1. In a process for producing ethylene glycol by reacting methanol and an organic peroxide, said peroxide having the formula R—O—O—R_1 wherein R and R_1 each is an alkyl or aralkyl group containing from 3 to 12 carbon atoms, the improvement comprising adding to the reactants a basic material in an amount sufficient to reduce the hydrogen ions that are being formed in the reaction without unduly reducing the ethylene glycol production due to by-product formation.

8. In a process for producing ethylene glycol by reacting methanol, an organic peroxide and formaldehyde in the presence of water, said organic peroxide having the formula R—O—O—R_1, wherein R and R_1 each is an alkyl or aralkyl group containing 3 to 12 carbon atoms, the improvement comprising adding to the reactants, a basic material in an amount sufficient to reduce the hydrogen ions that are being formed in the reaction without unduly reducing the ethylene glycol production due to by-product formation.

4,393,253

HYDROXYLATION OF OLEFINS

Robert C. Michaelson, Waldwick, and Richard G. Austin, Ridgewood, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 209,789, Nov. 24, 1980, Pat. No. 4,314,088. This application Oct. 9, 1981, Ser. No. 310,099

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.³ C07C *29/03, 33/20*; C07D *307/77*; C07C *59/105*

U.S. Cl. 568—860 **10 Claims**

1. A process for hydroxylating olefins which comprises reacting at least one olefinic compound having at least one ethylenic unsaturation with water and at least one organic hydroperoxide in the presence of a catalyst composition under conditions and in a manner sufficient to convert at least one of said ethylenic unsaturation to its corresponding diol said catalyst composition comprising:

(a) Osmium tetroxide; and

(b) at least one co-catalyst selected from the group consisting of alkali metal halide, alkaline earth metal halide, hydrogen halide, quaternary hydrocarbyl phosphonium halide, halogen, and transition metal halide said transition metal being selected from the group consisting of Fe, Co, Ni, Cu, V, Cr, Mn, Sc, Ti, Mo, Ru, Rh, Pd and W.

4,393,254

PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS

Fred L. Johnson, Jr., and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,412

Int. Cl.³ C07C *29/10*

U.S. Cl. 568—867 **8 Claims**

1. A process for the production of alkylene glycol which comprises contacting water and an alkylene oxide in the presence of a heterogeneous catalyst comprising a partially amine-neutralized sulfonic acid resin wherein the mole ratio of alkylene oxide to water ranges from about 2 to about 10, the temperature of reaction ranges from about 100° to 200° C. and the reaction pressure ranges from about 200 to 400 psi.

4,393,255

CATALYTIC CONVERSION

Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 110,436, Jan. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,658, Dec. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 819,026, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,883, Apr. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 443,557, Feb. 19, 1974, Pat. No. 3,980,583. This application Dec. 10, 1981, Ser. No. 329,481

Int. Cl.³ C07C *29/00, 33/22*

U.S. Cl. 568—902 **18 Claims**

1. A process for the conversion of a feedstock comprising carbon monoxide, hydrogen, and alcohol of from 1 to about 20 carbon atoms per molecule to product comprising an alcohol having a higher boiling point than said feedstock alcohol and an olefin which comprises contacting said feedstock under conversion conditions including a temperature of from about 100° C. to about 400° C., a pressure of from about 0.1 atmosphere to about 10,000 atmospheres, a contact time of from about 1 second to about 100 hours and a hydrogen/carbon monoxide mole ratio of from about 0.2 to about 5 with a catalyst comprised of a substrate of a porous refractory oxide having surface hydroxyl groups, a minimum surface area of about 10 m^2/g and pores with a minimum pore diameter of about 5 Angstrom Units, said substrate being modified by at least one amine functional member, containing the element silicon, coordinated to a metal function of a transition metal selected from the group consisting of Group VIII metals of the Periodic Table of Elements, said amine functional member acting as a bridging member between said substrate and said metal function, as a ligand covalently bonded to said substrate.

4,393,256

HYDRATION OF OLEFINS

Robert J. Schmidt, Rolling Meadows, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 17, 1981, Ser. No. 332,042

Int. Cl.³ C07C *29/06, 29/00, 31/08, 31/10*

U.S. Cl. 568—907 **11 Claims**

1. A process for the hydration of an olefinic hydrocarbon which comprises:

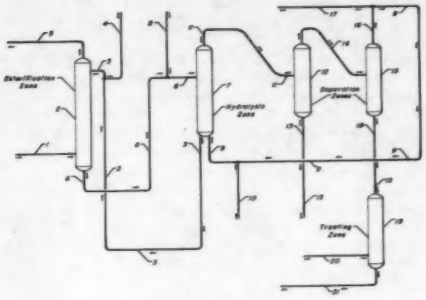
(a) esterifying said olefinic hydrocarbon with a concentrated inorganic acid at esterification conditions in an esterification zone to produce alkyl salts of said acid;

(b) hydrolyzing said alkyl salts of said acid by treatment with water at hydration conditions in a hydration zone to form an alcohol and ether hydrolysis product containing reconstituted inorganic acid;

(c) stripping away alcohol and ether hydrolysis product from said reconstituted inorganic acid and removing said reconstituted inorganic acid from said alcohol and ether hydrolysis product;

(d) separating said alcohol from said ether of said hydrolysis product in a separation zone at separation conditions to form a product alcohol stream and an ether stream;

(e) thermally decomposing said ether in a decomposition zone maintained at a temperature in the range of from about 500° C. to about 750° C. and a pressure in the range of from subatmospheric to about 1500 psi to produce an



olefinic hydrocarbon and an additional amount of product alcohol;

(f) recovering said additional amount of product alcohol; and

(g) recycling at least a portion of said olefinic hydrocarbon produced in thermal decomposition step (e) to said esterification as a part of said olefinic hydrocarbon.

4,393,257

PROCESS FOR PREPARING BENZOTRIFLUORIDE AND ITS DERIVATIVES

Tsuneo Nakagawa; Uji Hiramatsu, and Toshihide Honda, all of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

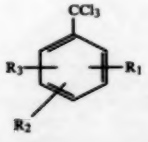
Continuation-in-part of Ser. No. 859,755, Dec. 12, 1977. This application Jun. 20, 1979, Ser. No. 50,211

Claims priority, application Japan, Dec. 27, 1976, 51-159033; Italy, Dec. 15, 1977, 30726 A/77; Fed. Rep. of Germany, Dec. 16, 1977, 2756235; France, Dec. 27, 1977, 77 39362

Int. Cl.³ C07C *17/20*

U.S. Cl. 570—145 **6 Claims**

1. A process for preparing benzotrifluoride derivatives which comprises contacting a benzotrichloride compound of the formula:



wherein R_1, R_2 and R_3 are each hydrogen, trichloromethyl, nitro, cyano or halogen but wherein all of R_1, R_2 and R_3 are not hydrogen at the same time and when one of R_1, R_2 and R_3 is nitro, each of the other two is not nitro, with hydrogen fluoride in the absence of any catalyst in the gaseous phase and in the presence of chlorine at an elevated temperature.

4,393,258

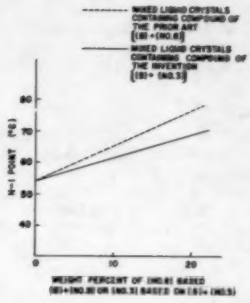
1-CYCLOHEXYL-2-CYCLOHEXYLPHENYLETHANE DERIVATIVES

Hisato Sato, Tokyo; Haruyoshi Takatsu, Kodaira; Yutaka Fujita, Yokohama; Masayuki Tazume; Kiyohumi Takeuchi, both of Urawa, and Hiroyuki Ohnishi, Kawagoe, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

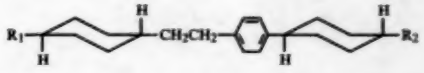
Filed Jun. 10, 1982, Ser. No. 386,994

Int. Cl.³ C07C *13/18, 13/28*

U.S. Cl. 585—25 **8 Claims**



1. A 1-cyclohexyl-2-cyclohexylphenylethane derivative of the following general formula



wherein R_1 and R_2, independently from each other, represent a linear alkyl group having 1 to 7 carbon atoms.

4,393,259

PROCESS FOR CONVERSION OF PROPANE OR BUTANE TO GASOLINE

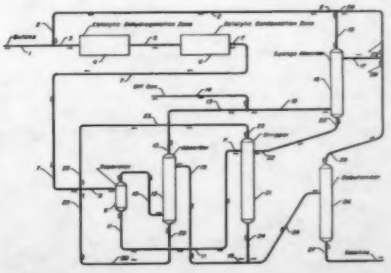
Dennis J. Ward, South Barrington, and Bipin V. Vora, Elk Grove Village, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 121,353, Feb. 14, 1980, Pat. No. 4,293,722, and a continuation-in-part of Ser. No. 163,763, Jun. 27, 1980, Pat. No. 4,304,948. This application Aug. 5, 1981, Ser. No. 290,031

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ C07C *2/08*

U.S. Cl. 585—315 **5 Claims**



1. A hydrocarbon conversion process which comprises the steps of:

(a) passing a feed stream comprising a butane and a hereinafter characterized recycle stream into a dehydrogenation zone operated at butane dehydrogenation conditions and thereby forming a dehydrogenation zone effluent stream comprising hydrogen, a butane and a butylene;
(b) passing the entire dehydrogenation zone effluent stream into a catalytic condensation zone operated at conditions which effect the conversion of butylene into C_8 hydrocarbons and thereby forming a catalytic condensation zone effluent stream which comprises hydrogen, a butane and C_8 hydrocarbons; and,
(c) separating the catalytic condensation zone effluent stream into a vent gas stream comprising hydrogen, said recycle stream, which comprises hydrogen and a butane, and a product stream which comprises C_8 hydrocarbons.

4,393,260

PREPARATION OF CYCLOHEXENYL COMPOUNDS

Louis J. Velenyi, Lyndhurst; Serge R. Dolhyj, Parma, and Andrew S. Krupa, Twinsburg, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 174,463, Aug. 1, 1980, Pat. No. 4,319,066. This application Jun. 5, 1981, Ser. No. 270,703
Int. Cl.³ C07C *1/20, 1/32, 1/00*
U.S. Cl. 585—357 7 Claims

1. A process for preparing a cyclohexenyl compound, the process comprising contacting a corresponding cyclohexyl carboxylic acid with a decarboxylation catalyst of the formula:

$$M_aM'_bO_x$$

where
M is a combination of copper and molybdenum;
M' is at least one of sodium, potassium, cesium, tin and bismuth;
a is a number of about 0.1 to 1;
b is a number of about 0.01 to 0.5 and
x is the number of oxygen atoms determined by the valence requirement of the other elements present.

4,393,261

HYDROCARBON RESIN AND PROCESS FOR PREPARATION

Robert P. Allen, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,632
Int. Cl.³ C07C *3/18*
U.S. Cl. 585—422 12 Claims

10. A process for preparing a liquid hydrocarbon resin having a Gardner color of about 2 or less and a viscosity of about 1,500 cp. at 38° C. to about 10,000 cp. at 38° C. comprising polymerizing a mixture of xylene and norbornene with a Friedel-Crafts catalyst at a temperature of about 60° C. to about 170° C. for a period of from 1 to 4 hours and hydrogenating to provide a water white liquid hydrocarbon resin.

4,393,262

PRODUCTION OF ISOPROPYLBENZENE

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,626
The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.
Int. Cl.³ C07C *63/34*; B01J *29/06*
U.S. Cl. 585—467 10 Claims

1. A process for the propylation of benzene with selective production of isopropylbenzene, said process comprising contacting mixtures of benzene and propylene with a crystalline zeolite catalyst at a temperature of between about 100° C. and the critical temperature, and a pressure of between about 10^5 N/m^2 and 6×10^6 N/m^2, said zeolite being characterized by a silica/alumina mole ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, said zeolite being 2 sm-12.

4,393,263

TERTIARY-BUTYLSTYRENE PRODUCTION

Glen F. Crum, Odessa, Tex., and Samuel J. Paton, Wilaya D'Oran, Algeria, assignors to El Paso Products Company, Odessa, Tex.

Filed Jan. 29, 1980, Ser. No. 116,659
Int. Cl.³ C07C *5/48*
U.S. Cl. 585—443 6 Claims

1. A process for the production of tertiary-butylstyrene under oxydehydrogenation conditions which comprises contacting a feed mixture of tertiary-butylethylbenzene and oxygen at a temperature in the range between about 350° C. and 650° C. with a coprecipitated aluminum-calcium-silicon-tungsten phosphate catalyst, wherein the aluminum:calcium:silicon:tungsten elements, respectively, are present in the catalyst in an atomic ratio of about 1–12:1–12:0.2–5:2–20, and wherein the conversion selectivity to tertiary-butylstyrene is at least 80 mole percent, and the conversion selectivity to dialkenylbenzenes is essentially zero mole percent.

4,393,264

CONTINUOUS NON-CATALYTIC PYROLYSIS OF AQUEOUS SLURRY OF OXYGEN-CONTAINING DERIVATIVES OF BENZENE AND TOLUENE

John K. Allen, St. Charles, and Gerard C. Lammers, Oswego, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 86,451, Oct. 19, 1979, abandoned. This application Aug. 7, 1980, Ser. No. 176,086
Int. Cl.³ C07C *1/20*
U.S. Cl. 585—469 10 Claims

1. A continuous method of non-catalytic pyrolysis of a solid mixture comprising aldehydo-, keto, carboxy-, aldehydo-and-carboxy-, keto-and-carboxy-, and methylol-and-carboxy-, substituted benzenes and toluenes to decarboxylate and decarbonylate such mixture which comprises adding a suspension of comminuted solid mixture of said substituted benzenes and toluenes in water, but without an externally added catalyst, to a bed of inert, non-catalytic particulated solids which can be fluidized, expanded or made ebullient with the flow of a gas through said bed wherein said bed is heated to a temperature of at least 700° C. and the gas stimulating said movement of the particles in the bed is nitrogen, air, or a mixture of nitrogen and air, or a mixture of air and oxygen gas, or oxygen gas alone or in admixture with steam.

4,393,265

LIGHT MONOOLEFINS FROM METHANOL AND/OR DIMETHYL ETHER

Cristobal Bonifaz, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 24, 1981, Ser. No. 286,604
Int. Cl.³ C07C *1/24, 1/20*; B01J *29/38, 29/06*
U.S. Cl. 585—639 15 Claims

1. Process of preparing hydrocarbons rich in light monoolefins by:
(a) activating a hydrogen-exchanged aluminosilicate catalyst having a silica to alumina ratio of less than 12 by treating with steam at a temperature of at least 400° C.;
(b) contacting the steam-activated catalyst in a reaction zone, at a temperature of about 350° to about 600° C., with a gas stream consisting essentially of dimethyl ether or a mixture of methanol and dimethyl ether, as reactant, and sufficient water such that the mole ratio of water to ether in the reaction zone is at least 0.3, at a pressure of about 0.2 to about 30 atmospheres (about 20 to about 3000 kPa), and at a weight hourly space velocity (WHSV) of greater than about 0.5 h^{-1}, to convert at least 85 wt.% of the reactant to hydrocarbons comprising at least 50 wt.% ethylene and

propylene, said 85% conversion being achieved before the contacting has exceeded 1 g of reactant per g of catalyst, until the catalyst is spent; and

(c) regenerating the spent catalyst with a mixture comprising steam and oxygen at a temperature of at least 400° C.

4,393,266

SEPARATION OF PARA-XYLENE

William Smolin, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 152,865, May 23, 1980, Pat. No. 4,351,981. This application Aug. 27, 1982, Ser. No. 412,448

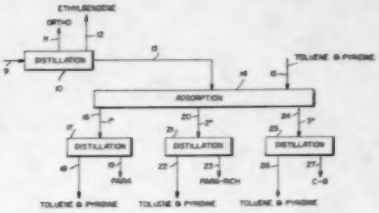
Int. Cl.³ C07C 7/13

U.S. Cl. 585—828 **22 Claims**

1. The process for separating para-xylene from a feed mixture containing C-8 aromatic hydrocarbon including para-xylene which comprises

contacting said feed mixture with, as an adsorbent, a pyridine or substituted pyridine-containing sodium Y zeolite, said sodium Y zeolite being characterized by a ratio of silicon to aluminum of 1.5–2.1 and by a pyridine or substituted pyridine content of at least about 3.3 wt.% based on said zeolite, thereby selectively adsorbing substantially all of said C-8 aromatic hydrocarbon to the substantial exclusion of para-xylene; and

recovering said para-xylene.

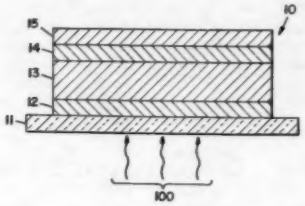


4,393,267

METHOD FOR IMPROVING THE EFFICIENCY OF A SOLAR CELL AND AN IMPROVED CADMIUM SULFIDE/COPPER SULFIDE PHOTOVOLTAIC CELL

Terry M. Peterson, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 267,324, May 26, 1981, abandoned. This application Jun. 29, 1981, Ser. No. 278,799
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—260 8 Claims



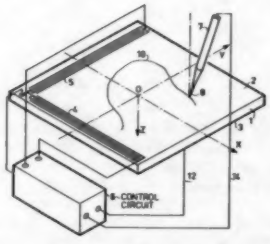
1. A method of fabricating a solar cell, comprising:
(a) fabricating a layer of CdS on a conductive substrate and forming an ohmic contact thereto;
(b) fabricating a Cu_xS layer on said layer of CdS;
(c) rinsing the device of the previous steps (a) and (b) in an aqueous acid rinse having a pH less than about pH 3;
(d) curing the device of step (c) in H_2 at an elevated temperature; and
(e) fabricating an electrical contact to said copper-containing layer.

4,393,268

MARKING SYSTEM USING ELASTIC SURFACE WAVES

Richard Guedj; Eugene Dieulesaint, and Daniel Royer, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 19, 1981, Ser. No. 265,325
Claims priority, application France, May 23, 1980, 80 11551
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—18 9 Claims



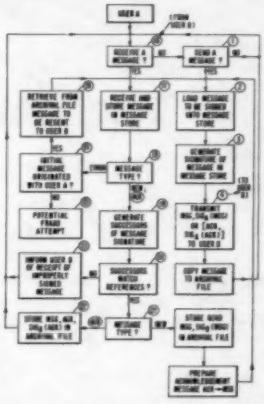
1. A marking system using elastic surface waves comprising:
a substrate for the surface propagation of linear wavefronts of said waves along a free surface in two separate directions with the vibratory energy propagating perpendicularly to said linear wavefronts, and having an uneven area with a depth significantly less than the wavelength of said elastic surface waves;
an electro-mechanical transducer coupled to said substrate for producing said waves;
excitation means connected to said transducer means for supplying pulses to excite said transducer means;
a stylus having a tip adapted for movement over said surface in contact therewith including a member for feeding a marking substance to said tip to leave a mark on said surface as said tip is moved over said surface and transmitting a pulse induced in said tip by passage of said linear wavefronts of said elastic surface waves; and
chronometric means connected to said excitation means and to said stylus for measuring the time taken by the elastic waves to reach the stylus of said two directions and thus the position of said stylus.

4,393,269

METHOD AND APPARATUS INCORPORATING A ONE-WAY SEQUENCE FOR TRANSACTION AND IDENTITY VERIFICATION

Alan G. Konheim, Yorktown Heights; Stephen M. Matyas, and Carl H. Meyer, both of Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,494
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.08 24 Claims



12. A method for verifying the content of a message and the identity of the sender, said method comprising two participants (USER A and USER B) first exchanging a contract containing two finite sequences of keyed-reference-signatures:

$$KSS_r(k_A,1)KSS_r(k_A,2),\ldots$$

$$KSS_r(k_B,1)KSS_r(k_B,2),\ldots$$

wherein the j^{th} reference signature $KSS_r(k_X,j)$ of USER X is the r^{th} or final term in the j^{th} keyed-signature-sequence

$$KSS_0(k_X,j)KSS_1(k_X,j),\ldots,KSS_r(k_X,j)$$

whose terms are defined and related as follows: the initial element

$$KSS_0(k_X,j)$$

of the j^{th} sequence is derived from USER X's (secret) key k_X and the index j specifying the keyed-signature-sequence by means of the rule

$$KSS_0(k_X,j)=DES\{k_X,j+k_X\}$$

where DES denotes the Data Encryption Standard and wherein each succeeding element $KSS_i(k_X,j)$ with $i=1, 2, \ldots, r$ of the j^{th} keyed-signature-sequence is derived from the immediately preceding element $KSS_{i-1}(k_X,j)$ by a known algorithm f according to the rule

$$KSS_i(k_A,j)=f(KSS_{i-1}(k_A,j)$$

to transmit signed data to USER B, USER A, appending to DATA a number s of signatures

$$DATA.SIG_0.SIG_1, \ldots, SIG_{s-1}$$

the t^{th} signature SIG_t where $t=0, 1, \ldots, s-1$ being the element in position ρ_t

$$KSS_{\rho t}(k_A.NUM_t)$$

in USER A's NUM_t^{th} keyed-signature-sequence

$$KSS_0(k_A.NUM_0).KSS_1(k_A.NUM_1), \ldots, KSS_t(k_A.NUM_t)$$

the position ρ_t of the t^{th} signature SIG_t being determined by the rank of the data

$$\rho_0.\rho_1, \ldots, \rho_{s-1}$$

USER A determining the rank of data to produce a sequence of s numbers

$$\rho_0.\rho_1, \ldots, \rho_{s-1}$$

each term being an integer having one of the values 0, 1, . . . , r−1. The value of the t^{th} term ρ_t depends on DATA through a predetermined cryptographic protocol,

USER B, upon receipt of the signed message

$$DATA.SIG_0.SIG_1, \ldots, SIG_{s-1}$$

independently determining the rank of DATA,

$$\rho_0.\rho_1, \ldots, \rho_{s-1}$$

USER B then deriving presumptive values for the s reference elements by computing the appropriate successor reference signatures for each of the s appended signatures; as defined by:

$r-\rho_0{}^{th}$ successor of SIG_0

$r-\rho_1{}^{th}$ successor of SIG_1

. . .

. . .

. . .

$r-\rho_{s-1}{}^{th}$ successor of SIG_{s-1}

USER B comparing the computed successor reference elements to the corresponding reference signatures in the previously exchanged contract, and

USER B accepting the transaction if and only if there is complete agreement.

4,393,270

CONTROLLING PERCEIVED SOUND SOURCE DIRECTION

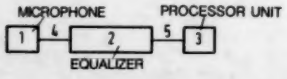
Johannes C. M. van den Berg, Kleibroek 14, Castricum, Netherlands

Continuation-in-part of Ser. No. 964,372, Nov. 28, 1978. This application May 28, 1980, Ser. No. 153,903

Claims priority, application Netherlands, Nov. 28, 1977, 7713076

Int. Cl.³ H04R 3/00, 5/00

U.S. Cl. 179—1 D **6 Claims**



1. A method of generating and processing electrical signals indicative of sound so that upon conversion of such signals into sounds and audition of such sounds by a normal human listener, such listener will perceive such sounds as emanating in preselected directions of perception from the listener, said method comprising the steps of:

(a) generating a plurality of signals each respectively from one of a plurality of directional microphones, each such microphone being predominantly responsive to sounds impinging on it in a unique one of a plurality of preselected directions of reception; and

(b) separately modulating each said electrical signal with a unique modulating signal indicative of a different one of said preselected directions of perception so that during such modulation different amplitude adjustments will be applied to different components of said signal, such adjustments varying with frequency in a manner corresponding to the variation of amplitude response with frequency of the normal human auditory system for sounds impinging on a listener from such one direction.

4,393,271

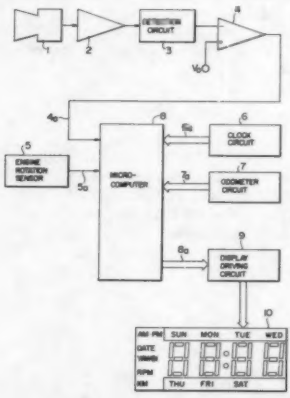
METHOD FOR SELECTIVELY DISPLAYING A PLURALITY OF INFORMATION

Hiroshi Fujinami, Bloomfield Hills, Mich., and Takashi Yamada, Anjo, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 3,935, Jan. 16, 1979. This application Aug. 27, 1980, Ser. No. 181,903

Int. Cl.³ G10L 1/00

U.S. Cl. 179—1 SM **1 Claim**



1. A method for selectively displaying on a single display unit in a vehicle a value of any one of time, a plurality of calendar data and a plurality of vehicle operating condition data in response to voice commands associated with said types of data comprising the steps of:

preliminarily associating a unique signal pattern with each of said calendar data and vehicle operating condition data;

generating signals indicative of the time, each of said calendar data and each of said vehicle operating condition data;

displaying initially the time on said single display unit until any voiced command is received;

receiving a voice command by a microphone to produce voice signals corresponding to said voiced command;

matching a signal pattern of said voice signals with said unique signal pattern preliminarily associated with one of said plurality of calendar data and said plurality of vehicle operating condition data;

further displaying in place of said initial displaying step a value of one of signals generated by said signal generating step and selected by said matching step on said single display unit;

limiting the display of a value of one of said calendar data of

lesser importance to a predetermined period of time to resume the display of the time thereafter; and

continuing the display of a value of one of said vehicle operating condition data of greater importance than said calendar data by said further displaying step and the resumed display of the time until another voiced command is received by said receiving step.

4,393,272

SOUND SYNTHESIZER

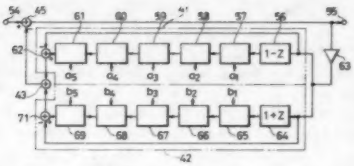
Fumitada Itakura, Houya, and Noboru Sugamura, Iruma, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,782

Claims priority, application Japan, Oct. 3, 1979, 54-128365

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SA **27 Claims**



1. A sound synthesizer comprising:

a sound source signal source for generating a sound source signal;

a control parameter source for delivering control parameters a_i, b_i (i=1, 2, 3. . .) for controlling the characteristic of a synthesis filter, said control parameters a_i, b_i being expressed by $a_i = -2\cos\omega_i$ and $b_i = -2\cos\theta_i$ where ω_i and θ_i are LSP parameters and $0 < \theta_1 < \omega_1 < \theta_2 < \omega_2 < \theta_3 \ldots < \pi$; and

all-pole type synthesis filter means for synthesizing a sound signal under the control of said control parameters, said all-pole type synthesis filter means comprising: feedback adder means one input of which is supplied with said sound source signal, and first and second feedback means the input side of each of which is supplied with the output from said synthesis filter means and the output of each of which is supplied to another input of said feedback adder means thereby to provide first and second feedback loops, said first and second feedback means respectively including in the feedback paths thereof first cascade operating second-order filter means expressed by $(1+a_iZ+Z^2)$ and second cascade operating second-order filter means expressed by $(1+b_iZ+Z^2)$ where Z represents unit time delay means.

4,393,273

FM-RECEIVER WITH TRANSMITTER CHARACTERIZATION

Theodoor A. C. M. Claasen; Gerardus C. M. Gielis; Johan M. Schmidt, and Harry B. Schoonheijm, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

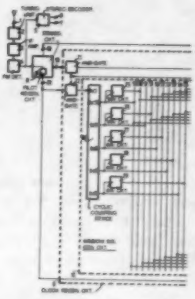
Filed Jan. 19, 1981, Ser. No. 226,561

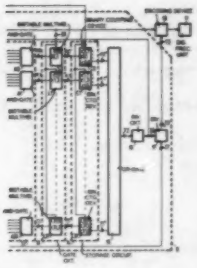
Claims priority, application Netherlands, Jan. 31, 1980, 8000607

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GD **12 Claims**

1. A clock regeneration circuit for an FM-receiver with transmitter characterization having a tuning unit connected to an aerial input and to which there are connected one after the other, an IF-amplifier, an FM-detector, a demodulation circuit for demodulating a discrete transmitter characterization signal, a decoding device for decoding the discrete transmitter characterization signal and a signal processing unit, also comprising a pilot regeneration circuit connected to the FM-detector for regenerating a stereo pilot signal, characterized in that the clock regeneration circuit comprises a phase search circuit having a cyclic counting device coupled to the pilot regeneration circuit for dividing at least a portion of the transmitter characterization signal into discrete phase steps determined by the periods of the pilot signal and also having a coincidence circuit connected to the cyclic counting device and to the demodulator for allotting phase steps to at least a portion of the pulse edges in the transmitter characterization signal, a storage





circuit for storing the information about the phase steps and a phase selection circuit connected to the storage circuit for selecting the phase step in which, statistically, the greatest number of pulse edges occur in the transmitter characterization signal, the clock regeneration circuit also comprising a divider which has a setting input coupled to the phase selection circuit, a signal input to the pilot regeneration circuit and a signal output to an output of the clock regeneration circuit.

4,393,274

AM STEREO RECEIVER

Yukihiko Miyamoto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 293,839

Claims priority, application Japan, Aug. 20, 1980, 55-117754[U]

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GS **2 Claims**

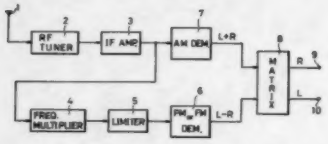
1. An AM stereo receiver comprising:

an RF AM tuner for selecting and converting an RF AM stereo signal of an AM-PM or AM-FM system into an IF AM stereo signal;

an IF AM signal amplifier for amplifying the IF AM stereo signal from the RF AM tuner;

a frequency multiplier for frequency multiplying the IF AM stereo signal from the IF AM signal amplifier to obtain a frequency-multiplied IF AM stereo signal having a frequency higher than the maximum frequency of a signal handled by the RF AM tuner;

A limiter for amplitude limiting the frequency-multiplied IF AM stereo signal from the frequency multiplier to obtain a frequency-multiplied IF PM or FM difference signal;



a PM or FM demodulator for phase or frequency modulating the frequency-multiplied IF PM or FM difference signal from the limiter to obtain a difference signal;

an AM demodulator for amplitude demodulating the IF AM stereo signal from the IF AM signal amplifier to obtain a sum signal; and

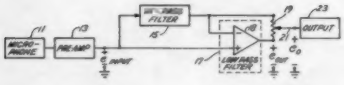
a matrix circuit for deriving a right signal and a left signal from the difference signal from the PM or FM demodulator and the sum signal from the AM demodulator.

4,393,275

HEARING AID WITH CONTROLLABLE WIDE RANGE OF FREQUENCY RESPONSE

Stanley Feldman, Evanston, and Gary Koch, Arlington Heights, both of Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

Filed Sep. 30, 1981, Ser. No. 307,009
Int. Cl.³ H04M 1/00
U.S. Cl. 179—1 VL **5 Claims**



1. A hearing aid having a wide range of frequency response, comprising:

microphone input means responsive to sound waves for generating an electrical signal representative of the sound waves;

high pass filter means for filtering said electrical signal, said high pass filter means generating a first signal representative of the high frequency portions of said electrical signal;

low pass filter means receiving both said electrical signal and said second signal, said low pass filter means generating a second signal representative of the amplitude subtraction of said last named signals;

proportioning means combining a selected amplitude portion of said first signal with a selected amplitude portion of said second signal for generating an output signal, said proportioning means minimizing frequency effects in said output signals in the frequency range where said high pass filter means and low pass filter means overlap,

control means connected to said proportioning means and manually adjustable for controlling the selected amplitude portions of said first and said second signals; and

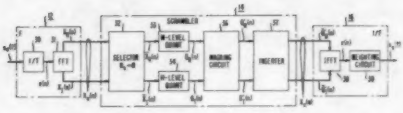
output means responsive to said output signal for enhancing the hearing of sound waves by a wearer of the hearing aid.

4,393,276

FOURIER MASKING ANALOG SIGNAL SECURE COMMUNICATION SYSTEM

Raymond Steele, Hazlet, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 19, 1981, Ser. No. 245,627
Int. Cl.³ H04K 9/00
U.S. Cl. 179—1.5 R **11 Claims**



1. In a secure communication system for analog communication signals:

a scrambling arrangement (**10**) capable of receiving as an input a time domain analog message communication signal ($x_d(t)$) and producing as an output signal a secure time domain analog communication signal ($x_s(t)$) related to said input message signal, and

a descrambling arrangement (**20**) capable of receiving as an input said secure time domain analog communication signal produced by said scrambling arrangement and transforming said secure signal back into said input time domain analog message communication signal

characterized in that

the scrambling arrangement includes:

a Fourier transform processor (**12**) capable of generating as an output a Fourier transform frequency domain signal ($X_d(n)$) related to the input time domain analog message communication signal;

scrambling means (**14**) capable of encoding said Fourier transform frequency domain signal produced by said Fourier transform processor to produce as an output a secure Fourier transform frequency domain signal ($X_s(n)$); and

an inverse Fourier transform processor (**16**) capable of transforming said secure Fourier transform frequency domain signal produced by said scrambling means into the secure time domain analog communication signal ($x_s(t)$); and

the descrambling arrangement includes:

a Fourier transform processor (**22**) capable of receiving as an input said secure time domain analog communication signal produced by said scrambling arrangement and generating as an output a secure Fourier transform frequency domain signal ($X_s(n)$) corresponding to said secure Fourier transform frequency domain signal produced by said scrambling means;

descrambling means (**24**) capable of decoding said secure Fourier transform frequency domain signal produced by said descrambling arrangement Fourier transform processor to produce as an output a Fourier transform frequency domain signal ($X_d(n)$) corresponding to said Fourier transform frequency domain signal produced by said scrambling arrangement Fourier transform processor; and

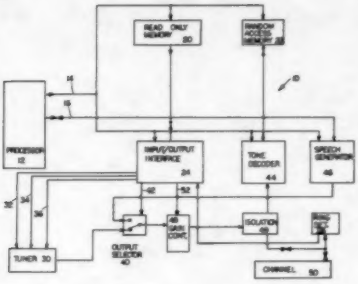
an inverse Fourier transform processor (**26**) capable of transforming said Fourier transform frequency domain signal produced by said descrambling means into the time domain analog message communication signal ($x_d(t)$).

4,393,277

REMOTE TUNER CONTROL SYSTEM

Peter D. Besen; Don H. Shulsinger, both of Arlington, Mass., and Stuart D. Goldberg, New York, N.Y., assignors to Selectastation, Inc., New York, N.Y.

Filed Mar. 18, 1981, Ser. No. 245,138
Int. Cl.³ H04M 11/00
U.S. Cl. 179—2 A 15 Claims



1. A remote tuner control system for responding to command signals generated by a user transmitted on a full-duplex communication channel comprising: tone decoder means coupled to said communication channel for conversion of pushbutton telephone tones generated by a user to binary numeric data; tuner means for reception of local audio broadcast radio signals; speech generator means for generating audio speech command menus and command acknowledgements; output selector means coupled to said tuner means and to said speech generator means for selection of audio information returned to the user; input/output interface means coupled to said tuner means and output selector means, said input/output interface means being adapted to control reception frequency of said tuner means and output selection of said output selector means; and processor means coupled to said input/output interface means, said speech generator means and said toner decoder means, said processor means being adapted to receive said binary numerical data from said tone decoder means and control said input/output interface means and said speech generator means in response to said binary numeric data from said tone decoder means.

4,393,278

TELEPHONE SECURITY SYSTEM

Allan M. Miyoshi, 6493 Ellenview Ave., Canoga Park, Calif. 91307

Filed Aug. 26, 1980, Ser. No. 181,993
Int. Cl.³ H04M 3/38
U.S. Cl. 179—84 C 3 Claims

1. An apparatus interposed between a telephone subscriber outlet and a telephone, comprising:

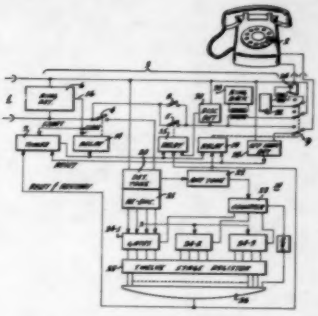
input means including ring detector means connected to the outlet and including a first switch, the detector means responding to incoming ring signals and being connected for closing the switch, the first switch being included in a circuit which, when completed, provides a through-connection from the subscriber outlet to the telephone, the circuit and through-connection being, however, not yet completed when the first switch is closed, the circuit requires for completion that the first switch be closed as a preparation for such completion;

means connected to be responsive to the closing of the switch and being connected to the outlet upon closing of the switch to be effective across the outlet for establishing impedance conditions equivalent to answering a phone so that ring signals arriving at the outlet will stop;

signal-detecting means connected to the circuit as prepared by said first switch closing and being responsive to dial signals received through the outlet after closing of the first switch and after the ring signals have stopped;

logic circuit means connected to the signal-detecting means to determine agreement between a sequence of the dial signals representing a dialed-in number and a preset number;

output means including a ring generator and a second switch



operated by the logic circuit means to complete a connection from said circuit as prepared by the first switch closing, to the ring generator and causing the ring generator to generate ringing signals for the telephone when said logic circuit has detected said agreement; and

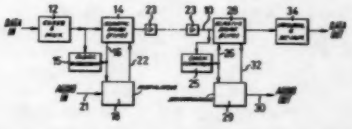
means for completing the through-connection of the circuit as prepared, to extend between the outlet and the telephone following an actual answering of the telephone by a person.

4,393,279

DIGITAL DATA TRANSMISSION SYSTEM HAVING FREQUENCY OR PHASE MODULATED DATA CARRYING SIGNALS TO PROVIDE SUPERVISORY CHANNEL

Peter Cochrane, and James A. Kitchen, both of Ipswich, England, assignors to The Post Office, England

Filed Jun. 8, 1981, Ser. No. 271,107
Claims priority, application United Kingdom, Jun. 16, 1980, 8019610
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.31 R 16 Claims



1. A digital data transmission system having send and receive equipment at terminal stations connected by a digital data communication link which includes one or more repeaters, wherein the send equipment includes means for frequency or phase modulating the occurrence timing of digital data carrying signals being transmitted along the link with additional information, and the or each repeater includes means for demodulating said frequency or phase modulation thus providing said additional information thereat, said modulation providing a supervisory channel by means of which the repeaters can be addressed and interrogated while simultaneously communicating said digital data carrying signals over said link.

4,393,280

ELECTRICAL SWITCHING ARRANGEMENT

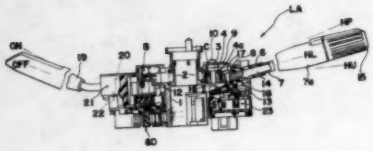
Masayosi Iwata, Hashima, and Harumi Douke, Komaki, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 30, 1980, Ser. No. 202,196

Claims priority, application Japan, Nov. 7, 1979, 54-155141[U]

Int. Cl.³ H01H 9/00

U.S. Cl. 200—4 8 Claims



1. An electrical switching arrangement for use in a motor vehicle or the like, said arrangement comprising:

a support frame;

a lever support member pivotally mounted on said support frame for pivotal movement about a first support axis;

a hollow control lever member pivotally mounted with respect to said lever support member for pivotal movement about a second support axis extending in a direction different from that of said first support axis;

a control shaft extending coaxially through the hollow interior of said control lever member and rotatable with respect thereto about the longitudinal axis thereof;

a first actuating member connected to said control lever member;

a second actuating member connected to said control shaft;

switching means mounted on said support frame and including:

a switch base;

a plurality of switch elements disposed on said switch base;

a second sliding member mounted for sliding movement in a predetermined first direction;

a first sliding member carried by said second sliding member for movement therewith in said first direction, said first sliding member being mounted for sliding movement with respect to said second sliding member in a second direction extending approximately at a right angle to said first direction;

a plurality of cam actuators mounted for movement with respect to said switch base for selective opening and closing of said switch elements; and

cam means on said first sliding member for selectively displacing said cam actuators with respect to said switch base; and

connecting means for connecting said second sliding member to one of said first and second actuating members and for connecting said first sliding member to the other of said first and second actuating members, such that upon selective pivoting movement of said control lever member about said second support axis and rotational movement of said control shaft about said longitudinal axis, said first sliding member is moved in said second direction independently of said second sliding member, or said first sliding member is moved in said first direction with said second sliding member, thereby to displace selectively said cam actuators for opening and closing selected of said switch elements.

4,393,281

DIP SWITCH

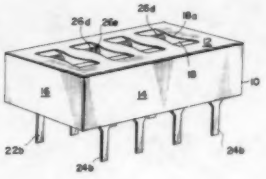
Hiroyuki Ohmori, Tokyo; Hiroshi Uchimura, Chiba, and Yuzo Mikage, Funabashi, all of Japan, assignors to Matsu Kyu Kabushiki Kaisha, Japan

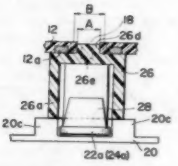
Continuation-in-part of Ser. No. 94,488, Nov. 15, 1979, abandoned. This application Aug. 18, 1981, Ser. No. 293,977

Claims priority, application Japan, Apr. 20, 1979, 54-53103[U]

Int. Cl.³ H01H 15/02

U.S. Cl. 200—16 D 9 Claims





1. A dual inline package switch assembly containing one or more separated electrical switches, comprising:

(a) an insulating housing having a base and a cover enclosing an interior space, at least one switch positioned in said interior space, said cover having a top wall with at least one elongated slit extending into said interior space in alignment with said switch;

(b) said switch including at least one pair of switch contacts having a first fixed arm extending on said base from one side of said housing, a second fixed arm extending on said base from the other side of said housing to face the free end of said first arm, and legs integral with and extending from each arm from the respective sides of said housing for insertion into electrical circuit openings, each arm being flat in a common plane and engaged against said base;

(c) said switch further including at least one actuating means movably positioned within said interior space and having an operating stub positioned in said slit of said housing and having a resilient conductive bridging strip for selectively breaking and making an electrical connection between said fixed arms with movement of said actuating means, said actuating means being displaceable onto said housing base for sliding movement thereon and said bridging strip having inwardly curved rounded end portions to maintain constant the pressure between said resilient conductive bridging strip and said fixed arms; and

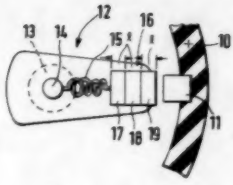
(d) said slit of said housing having a center neck whose width is slightly smaller than the diameter of said operation stub of said actuating means for detenting movement of said actuating means.

4,393,282

ELECTRODE FOR IGNITION SYSTEMS

Werner Grünwald, Gerlingen; Ernst Zehender, Althengstett; Karl-Hermann Friese, Leonberg; Jürgen Schmatz, Ludwigsburg; Hans Neu, Vaihingen; Kuno Kirner, Gerlingen, and Bernd Schumacher, Vaihingen-Aurich, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 75,906, Sep. 17, 1979, abandoned. This application Mar. 18, 1981, Ser. No. 245,170
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846590
Int. Cl.³ H01H *19/00*
U.S. Cl. 200—19 R 25 Claims



5. Electrical interference suppressed spark apparatus, particularly distributor for an internal combustion engine, to provide a spark across a spark gap, comprising

a first electrode (11, 21, 31, 41);

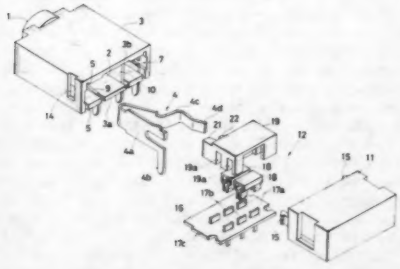
and a second electrode (16, 26, 27, 37, 44, 46, 54, 56) separated from said first electrode by said spark gap, said second electrode having an end part adjacent said spark gap, and wherein at least said end part has a minimum resistance per unit length of at least 400 ohms per millimeter.

4,393,283

JACK WITH PLUG ACTUATED SLIDE SWITCH

Toru Masuda, Higashi-Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jun. 9, 1981, Ser. No. 271,945
Claims priority, application Japan, Apr. 10, 1980, 55-48956[U]
Int. Cl.³ H01A *33/30*; H01H *9/02*
U.S. Cl. 200—51.09 5 Claims



1. A jack, comprising:

a jack case having a first opening for receiving a plug and a second opening for receiving a switch case;

a contact strip attached to an inner surface of the jack case, the contact strip being resiliently urged into a first position engageable by the plug on insertion thereof, the plug engaging and moving the contact strip to a second position, the contact strip having a free end portion, carried thereupon, disposed adjacent the second opening in the jack case; and,

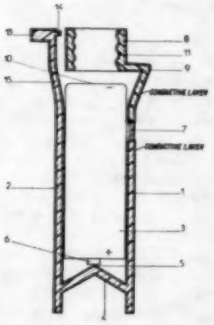
a switch case, having a self-contained switch mechanism therein, removably fitted into the second opening, the switch mechanism having electrical contacts and a movable member adapted to open and close the contacts, the movable member being engaged by the free end portion of the contact strip, opening and closing the contacts in response to insertion and removal of the plug.

4,393,284

DIRECT-CURRENT ELECTRIC SWITCH

Marc Rivollet, and Pierre Monzer, both of Oyonnax, France, assignors to Etablissements Fernand Berchet, Oyonnax, France

Filed Nov. 19, 1981, Ser. No. 322,755
Claims priority, application France, Nov. 21, 1980, 80 25023
Int. Cl.³ F21V *23/04*
U.S. Cl. 200—60 11 Claims



1. An electric switch for electrically connecting a direct-current source such as a cell, a battery, or a storage battery, to a load on a direct-current which is produced from the direct-current source, comprising an insulating, semi-rigid, integral piece of plastic covered with a conducting layer, said integral piece of plastic comprising:

a first blade provided with a means for making electrical contact between a first pole of the direct-current source and the load, said first blade also being provided with an electrical break to current passage along the length of the first blade;

a second blade which is parallel to the first blade and is arranged on an opposite side of the direct-current source from the first blade, said second blade being provided with a means to make electrical contact to the load wherein said second blade acts as a flexure member for said means to make electrical contact;

a means for keeping the direct-current source located between said first and second blades, said keeping means being attached to the first and second blades; and

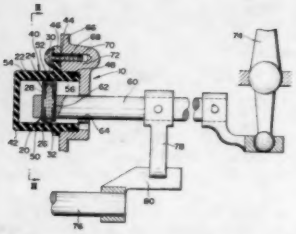
a connecting blade capable of absorbing shock energy and dimensional variation of said direct-current source, said connecting blade being joined to the bases of said first and second blades while being in electrical contact with a second pole of the direct-current source.

4,393,285

TRANSMISSION SWITCH ARRANGEMENT FOR A POWER TRANSMISSION RESPONSIVE TO SHIFTING OF GEAR POSITION

Kazuyoshi Hiraiwa, Yokohama, and Saburo Yamasaki, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 5, 1981, Ser. No. 260,699
Claims priority, application Japan, May 6, 1980, 55-58578
Int. Cl.³ H01H 9/06
U.S. Cl. 200—61.88 12 Claims



5. A transmission switch arrangement for detecting a transmission gear position to produce a gear position signal indicative of the transmission gear position in a power transmission, comprising:

a transmission housing;

a switch box secured to said transmission housing;

a striking rod connecting a shift lever and a transmission gear assembly for shifting operation of the transmission gear position in response to operation of said shift lever, said striking rod extending in substantially parallel relationship with the internal periphery of said switch box and movable in relation thereto;

a movable switch member secured on said striking rod for cooperation with a transmission gear shifting mechanism and disposed within said switch box, said movable switch member including a movable contact which opposes the internal periphery of the switch box; and

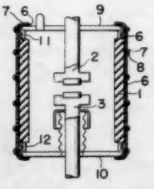
stationary contacts secured on the internal periphery of said switch box at locations facing said movable contact, said stationary contacts being arranged at locations respectively corresponding to each respective transmission gear position.

4,393,286

VACUUM CIRCUIT BREAKERS

Kunihiko Takagi, Tama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 15, 1979, Ser. No. 66,772
Claims priority, application Japan, Aug. 24, 1978, 53-102273; Aug. 24, 1978, 53-102274
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B 3 Claims



1. In a vacuum circuit breaker having a vacuum bulb including an insulating member for containing a movable contact and a stationary contact, the improvement which comprises:

a coating of a greasy compound of a water repellent material provided on the outer surface of said insulating member;

an insulating tube of a water repellent and heat shrinkable material provided on said coating of the greasy compound; and

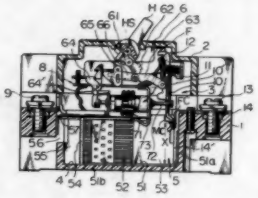
insulating rings between said coating of the greasy compound and said insulating tube.

4,393,287

ARC SUPPRESSING MEANS FOR CURRENT LIMITING CIRCUIT BREAKERS

Kunimitsu Nakano, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 10, 1980, Ser. No. 185,802
Claims priority, application Japan, Sep. 14, 1979, 54-129722[U]
Int. Cl.³ H01H 33/08, 9/34
U.S. Cl. 200—144 R 10 Claims



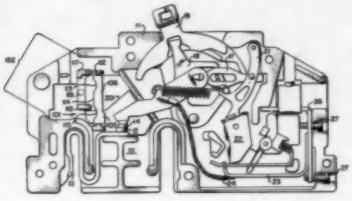
1. An arc suppressing means for current limiting circuit breakers comprising a base made of an insulative material for mounting a circuit breaker; a movable contactor pivoted to be rockable at one end having a movable contact; means for manually operating said movable contactor; means electrically connecting a load side terminal to the movable contactor; means for tripping a contact closing position of the movable contactor in response to an excess short-circuiting current; an arc suppressing chamber provided in said base so as to receive adjacent an end wall thereof at least said rockable end of the movable contactor; a fixed contactor mounted to the base and including a part having a fixed contact positioned to contact with said movable contact in said contact closing position adjacent said one end wall of said arc suppressing chamber, said part of said fixed contactor extending substantially in a direction parallel to the movable contactor along the one end wall of the arc suppressing chamber; a first arc running plate extended along a surface of the arc suppressing chamber which is perpendicular to said one end wall surface of the chamber and including means for electrically connecting said first arc running plate to said extended part of the fixed contactor; a second arc running plate disposed substantially in parallel to said first arc running plate and electrically connected to the movable contactor; and a deion grid disposed between said first and second arc running plates and arranged within the arc suppressing chamber with entrance ends of respective gaps directed to the one end wall of the arc suppressing chamber and with terminating the ends directed to the other end wall of the chamber, wherein said first arc running plate has a beginning end at said one end wall of the arc suppressing chamber, and said means for electrically connecting the first arc running plate to the fixed contactor is connected to said beginning end of the first arc running plate perpendicular to the first arc running plate and in substantially parallel relation to the movable contactor, said movable contact engaging said fixed contact adjacent the end of said connecting means that is remote from said beginning end of said first arc running plate to thereby render an excess short-circuiting current path on the side of the fixed contactor to be substantially maximum.

4,393,288

CIRCUIT BREAKER

Harold E. Beittary, Rio Piedras, P.R., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 23, 1981, Ser. No. 276,574
Int. Cl.³ H01H 33/08, 33/10
U.S. Cl. 200—144 R 9 Claims



1. In a circuit breaker including two electroconductive elements between which an arc may form, a molded insulated housing having a pair of opposing interior surfaces with each of said surfaces having an opposing formed recess extending along and close to the arc-path between said electroconductive elements, at least one of said electroconductive elements being supported from said molded housing, said molded housing being rigid and possessed of sufficient structural strength to be self-supporting, the improvement comprising the combination of

a pair of composition sheets, each said sheet residing alongside a respective said opposing surface and held in place within a respective said formed recess, said composition sheets including material comprising a water-insoluble binder and an arc suppressing substance selected from the class consisting of the oxides and hydrates of aluminum and magnesium, said binder constituting at least ten percent of the composition; and

a channel for providing electric arc cooling and quenching within said circuit breaker comprising an integral, generally U-shaped member forming a base and opposing side walls having a length from one end to an opposite end, said one end of said opposing side walls having extending widths thereby providing a pair of enlarged side wall surfaces for engaging with and being held by said composition sheets, each of said one end and said opposite end of said base being formed with an extending tab for engaging a molded feature of an interior surface of said molded housing, whereby said extending tabs and said composition sheets are adapted to space said channel away from said interior surfaces of said molded housing, thereby exposing surfaces of said channel not in contact with said sheets, said base having an arrangement of venting holes therein, and wherein

said composition sheets physically contact said extending widths of said channel but physically do not engage a majority of said length of said channel

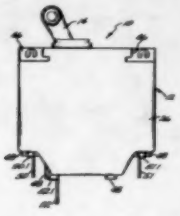
whereby said composition sheets, in addition to having arc suppression characteristics, also support said channel away from said molded housing, thereby helping exhaust gases produced during arcing to vent both through said venting holes and along said exposing surfaces of said channel, said sheets further insulating said channel thermally from said housing.

4,393,289

CIRCUIT BREAKER

Aime J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 878,957, Feb. 17, 1978, Ser. No. 755,514, Dec. 30, 1976. This application Aug. 6, 1979, Ser. No. 64,453
Int. Cl.³ H01H 33/08, 9/30
U.S. Cl. 200—147 R 4 Claims



1. A contact system for a circuit breaker comprising a pair of first electrical contacts which are disposed in spaced relation to each other in a common plane, and an electrically conductive contact arm having bifurcations at one end which are spaced apart along a line to be simultaneously engaged with the respective first contacts, said arm having an intermediate arm portion which extends parallel to said line to electrically connect the bifurcations to each other at a location closely adjacent to said one arm end, said arm having an additional portion extending from said intermediate arm portion to an opposite end of the arm, and said arm having said opposite end pivotally mounted on an axis which extends parallel to said line for pivoting the bifurcations in a first arc around said axis in side-by-side relation to each other and for pivoting said intermediate arm portion around said axis in a second arc spaced radially inward from the first arc, said arm being pivotable for moving the bifurcations between a closed circuit position in which the bifurcations lie in said plane engaging the first contacts and an open circuit position in which the bifurcations are moved out of said plane away from the respective first contacts, and said intermediate arm portion being located so that said intermediate arm portion is disposed in said plane at one side and radially inward from said line closely adjacent to said first contacts as the arm is moved into and out of said closed circuit position and so that electrical current flowing in said bifurcations and in said intermediate arm portion during said circuit opening and closing deflects electrical arcs formed between the bifurcations and contacts during said circuit opening and closing in a direction away from the contacts and away from the contact arm.

4,393,290

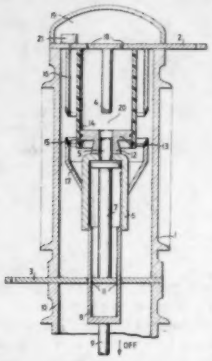
PUFFER-TYPE GAS BLAST SWITCH

Günter Mittelbach, Kassel; Günter Horstmann, Gudensberg; Werner Heiss, Kassel; Dietrich Hoffmann, Kassel-Kirchditmold; Günter Siebrecht; Karl Kriechbaum, both of Kassel, and Günter Rapp, Kassel-B, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,897
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909264; Mar. 9, 1979, 2909270; Oct. 22, 1979, 2942624; Oct. 22, 1979, 2942625; Oct. 22, 1979, 2942626; Oct. 22, 1979, 2942627
Int. Cl.³ H01H 33/88
U.S. Cl. 200—148 A 12 Claims

1. In a puffer-type gas blast circuit interrupter switch including means defining two separable power current conducting contacts between which an arc is created upon contact separation, a nozzle of insulating material disposed for directing a stream of gas against such arc, means including a stationary

piston and a movable cylinder defining a compressor operable by separation movement of the contacts to supply a mass of gas under pressure to the nozzle, a cylindrical member surrounding the region in which such arc is created and the nozzle, a shield member forming part of the nozzle, shaped to correspond with the cylindrical member and slidingly engaging the cylindrical member for guiding movement of the nozzle relative to the cylindrical member, and means defining an inter-



ruptable rated current conducting path in parallel with the power current conducting contacts, the rated current conducting path being interruptable before separation of the power current conducting contacts, the improvement wherein said rated current conducting path means comprise two stationary contact pieces spaced from one another and a contact bridging member mounted on said cylinder for connecting said stationary contact pieces together when said switch is closed.

4,393,291

GAS BLAST INTERRUPTERS

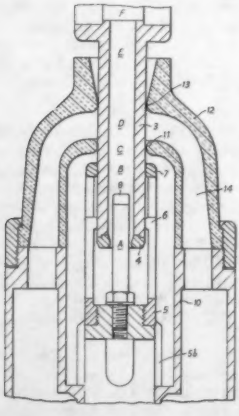
John S. Stewart, West Bridgford, and Stanislaw M. Gonek, Long Eaton, both of England, assignors to Brush Switchgear Limited, England

Filed Aug. 22, 1980, Ser. No. 180,340

Claims priority, application United Kingdom, Oct. 12, 1979, 7935551

Int. Cl.³ H01N *33/70*

U.S. Cl. 200—148 R **8 Claims**



1. A gas-blast type interrupter comprising:

(a) first and second electrodes, said first electrode having a tubular end on which two sets of contact formations are provided in an axially spaced apart relationship, said second electrode being slidably engaged by both of said sets of contact formations when said electrodes are in said closed position, and disengaging from one of said sets of contact formations before becoming disengaged from the other set of contact formations during movement of said contacts from said closed position towards said open position;

(b) means operative to move said first and second electrodes between a closed position in which said electrodes are in mutual electrical engagement and an open position in which said electrodes are mutually separated, movement of said electrodes from said closed position toward said open position causing an arc to be drawn therebetween;

(c) a tubular housing having an interior in which said first electrode is disposed;

(d) a guide surrounding said tubular housing, said guide and said tubular housing defining therebetween an annular chamber into which pressurized gas is supplied upon movement of said electrodes from said closed position toward said open position;

(e) means defining a first insulating orifice in said tubular housing through which said second electrode substantially sealingly passes when said electrodes are in said closed position, said second electrode passing out of the first insulating orifice during movement of said electrodes toward said open position thereby premitting said pressurized gas from the annular chamber to flow through the first insulating orifice into said interior of said tubular housing in a direction essentially along said arc; and

(f) means defining a second insulating orifice in said guide through which said second electrode also substantially sealingly passes when said electrodes are in said closed position, said second electrode passing out of the second insulating orifice during movement of said electrodes towards said open position thereby permitting said pressurized gas from the annular chamber to flow through the second insulating orifice in a direction opposed to the direction of gas flow through the first insulating orifice, the first and second insulating orifices being co-axial and of essentially the same size.

4,393,292

METHOD OF AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING A SMALL AND DEEP HOLE INTO OR THROUGH A WORKPIECE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 29, 1980, Ser. No. 182,423

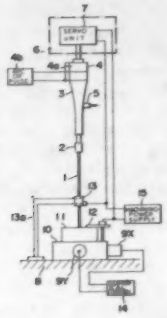
Claims priority, application Japan, Jul. 17, 1979, 55-98266; Aug. 30, 1979, 54-110552; Aug. 31, 1979, 54-111427; Nov. 6, 1979, 54-144117; Nov. 29, 1979, 54-155107; Dec. 27, 1979, 54-172587

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 M **33 Claims**

1. A method of electrical discharge machining a small and deep hole having a diameter of 1 mm or less and a depth to diameter ratio of at least 5 into or through a workpiece, the method comprising the steps of: juxtaposing a thin and elongated tubular electrode with the workpiece across a machining gap; supplying a water machining fluid through the tubular electrode into the machining gap at a pressure of at least 20 kg/cm^2; applying a series of electrical machining pulses between the tubular electrode and the workpiece to cause time-

spaced electrical discharges through the machining gap thereby removing material from the workpiece; and advancing the tubular electrode in its longitudinal direction relatively into the workpiece.



4,393,293

RESISTANCE WELDING MACHINE

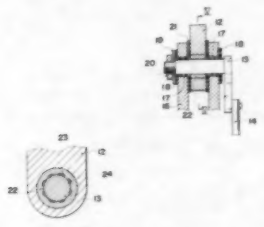
Nobuyoshi Inoue, and Tomomi Kishi, both of Toyotashi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 24, 1981, Ser. No. 257,171

Claims priority, application Japan, May 13, 1980, 55-064460[U]

Int. Cl.³ B23K *11/10*

U.S. Cl. 219—90 **5 Claims**



1. A resistance welding machine comprising: a first electrode; a second electrode pivotally movable toward and away from the first electrode to engage work therebetween to supply electric resistance welding current to the work; a main body supporting the first electrode; an electrically conductive arm pivotally supported on the main body and supporting the second electrode and making electrical contact therewith to conduct the welding current; a conductive shaft extending through the body; power conductor means rigidly connected to the shaft, said shaft being non-rotably held in the body; conductive bushing means inserted in the arm and making good electrical contact therewith to conduct the welding current, said bushing means being rotatably mounted on the shaft and comprising an inner surface defined by regions of cylindrical curvature closely conforming to the surface of the shaft rotatably supporting the bushing means to make good electrical contact therewith to permit the welding current to flow therethrough and to furnish rotational mechanical support for the arm around the shaft, the inner surface of the bushing comprising a plurality of recesses spaced therearound to receive powdered material generated by rotational rubbing of the inner surface of the bushing on the shaft and lubricant to entrap the powdered material in the recesses; and hollow cylindrical and annular radial insulating means surrounding the shaft axially outward of the bushing and between the shaft and the main body to electrically insulate the shaft, the arm, and the power conductor means from the main body.

4,393,294

ELECTRON BEAM WORKING APPARATUS FOR CYLINDRICAL MEMBERS

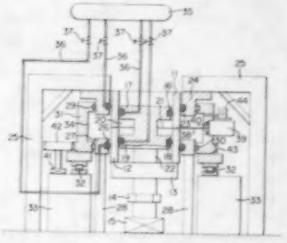
Michitsune Shima; Seiichi Iida, both of Kobe; Shiso Kihara, Akashi; Masaharu Minami, Kobe; Toshikazu Shimoyama, Kobe; Genta Takano, Kobe, and Akira Kato, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 30,877, Apr. 17, 1979, abandoned. This application Jan. 9, 1981, Ser. No. 223,927

Claims priority, application Japan, May 17, 1978, 53-65088

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EC **2 Claims**



1. An electron beam apparatus for welding a pair of cylindrical workpieces having inner and outer surfaces and stacked one on the other and abutting along a circular line around the periphery thereof, said apparatus comprising:

two disk-shaped partition plates having inflatable annular seal members disposed along the respective outer peripheral edges thereof, which partition plates are adapted to be placed inside the pair of cylindrical workpieces with one above and the other below the circular line wherein the workpieces abut with said seal members pressed against the inner peripheral surfaces of the pair of cylindrical workpieces to define a first vacuum chamber surrounded by said two partition plates and the inner peripheral surfaces of the pair of cylindrical workpieces;

two annular fixed chamber wall members having inflatable annular seal members disposed along the respective inner peripheral surfaces thereof, which chamber wall members are adapted to be placed outside the pair of cylindrical workpieces with one above and the other below the circular line wherein the workpieces abut with said seal members pressed against the outer peripheral surfaces of the pair of cylindrical workpieces;

an annular rotary chamber wall member rotatably mounted around said two annular fixed chamber wall members and a seal member on the rotary chamber wall members adjacent the upper one of said partition plates and a seal member on the rotary chamber wall members adjacent the lower one of said partition plates, said seal members being in sliding sealing contact with said fixed chamber wall members to thereby form a second vacuum chamber surrounded by the outer peripheral surfaces of said cylindrical workpieces, said two annular fixed chamber wall members and the inner peripheral surface of said rotary chamber wall member; vacuum means disposed outside said chamber wall members and connected to said vacuum chambers; pressure fluid means outside the workpieces and connected to said seal members for supplying pressure fluid thereto; and

an electron gun on said rotary chamber wall member level with the circular line wherein the workpieces abut for directing an electron beam against the circular line

wherein the workpieces abut so that electron beam welding can be carried out along the circular line wherein the workpieces abut while said rotary chamber wall member is being rotated with respect to the cylindrical workpieces.

4,393,295

APPARATUS AND METHOD FOR ENGRAVING WITH AN ELECTRON BEAM

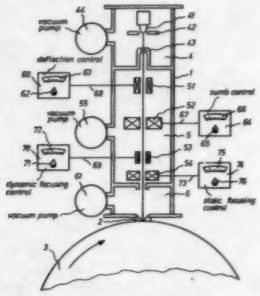
Siegfried Beisswenger; Wolfgang Boppel, both of Preetz, and Dieter Grieger, Kiel, all of Fed. Rep. of Germany, assignors to Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,869

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947444

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EJ **6 Claims**



1. An electron beam engraving method for the fast, successive generation of depressions of different sizes in the surface of a workpiece, whereby the different depressions are generated by means of the different influence of the electron beam, comprising the steps of directing the beam on the workpiece, and defocusing said beam on the workpiece in the periods between the generation of the individual depressions while maintaining the electron beam on the workpiece during said periods between the generation of depressions such that cutting does not occur.

4,393,296

APPARATUS FOR THE CONTINUOUS MANUFACTURE OF METALLIC ANODES FROM MOLTEN METAL

John M. A. Dompas, Olen, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Division of Ser. No. 957,445, Nov. 3, 1978, abandoned. This application Mar. 9, 1981, Ser. No. 241,612

Claims priority, application Luxembourg, Nov. 16, 1977, 78531; Jun. 21, 1978, 79853

Int. Cl.³ B23K *7/02, 9/00*

U.S. Cl. 219—121 PC **13 Claims**

1. An apparatus for cutting a moving metallic strip into uniform pieces along a predetermined profile, comprising:

(a) a frame;

(b) a cutting zone;

(c) a carriage mounted on said frame above said moving metallic strip, said carriage adapted to move within said cutting zone in a direction of movement with the movement of said metallic strip and in the opposite direction;

(d) a thermal cutting device containing at least one plasma torch, said cutting device mounted on said carriage and adapted to travel in a direction transverse to the direction of movement of said metallic strip;

(e) an endless roller conveyor having an upper run for supporting said metallic strip in the cutting zone, said roller conveyor adapted to move in said cutting zone in the same direction as said metallic strip, each roller of said roller conveyor including an inner cavity defined by a peripheral surface for supporting said metallic strip and opposed side walls, and a plurality of apertures formed in said side walls providing a communicating path from the exterior of each said roller to its inner cavity for entry of a cooling liquid, said apertures arranged in a position in said side walls to retain a volume of cooling liquid within said inner cavity providing a measure of cooling during movement of each roll along said upper run;

(f) a tank filled with a cooling liquid, each said roller of said roller conveyor moving through said tank for entry of said cooling liquid through said apertures into said inner cavity thereby to mix with and thereby reduce the temperature of the cooling liquid therein and to cool the peripheral surface and side walls of each said roller before moving toward said upper run; and

(g) an evacuation zone for the cut metallic pieces.

4,393,297

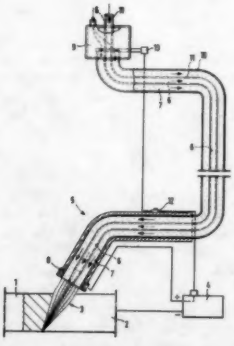
METHOD FOR THE ARC CUTTING OF METAL

Juhani Niinivaara, Elimäki, Finland, assignor to Osmo Asonen, Finland

Filed Jul. 24, 1981, Ser. No. 286,510

Int. Cl.³ B23K *9/00, 35/00*

U.S. Cl. 219—137 R **11 Claims**



1. In a method for arc cutting of metal, in which method an electric arc is formed between the metal and a cutting torch, and the cutting is achieved by simultaneously blowing gas into the cut; the improvement comprising injection of a paste through the torch into the region of the arc, said paste containing a finely-divided electrically conducting substance mixed with a carrier, so that the aforesaid finely-divided substance acts as an electrode which causes the electric arc to be struck.

4,393,298

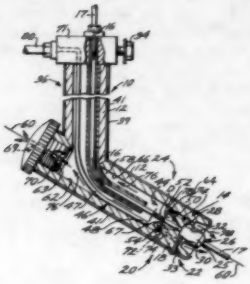
LIQUID COOLING FOR A WELDING TORCH

John G. Frantzreb, Sr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 973,048, Dec. 7, 1978, abandoned. This application Sep. 24, 1980, Ser. No. 190,132

Int. Cl.³ B23K 9/16

U.S. Cl. 219—137.62 7 Claims



1. In a welding torch (10) having a body (12) and an electrode pathway (16), said body (12) having a contact tip assembly (14) and first and second end portions (24,36), said contact tip assembly (14) being positioned at said first end portion (24) of said body (12), said electrode pathway (16) passing through said contact tip assembly (14), the improvement comprising:

said body (12) having a central axis (60) and walls (62,63,64) defining a central chamber (58), said central chamber (58) having a periphery (66) and being symmetrical about said central axis (60);

an expansion element (44) defined by a surface (50) and positioned for receiving a flow of liquid and controllably initiating a flow of gas in said central chamber (58) in response to gasification of said liquid at said expansion element (44), said surface (50) defining an aperture (52) symmetrical about said central axis (60) and through which said central axis (60) passes and opening through a wall (64) of said body (12) into said central chamber (58) immediately adjacent said contact tip assembly (14);

vent means (69) for controllably maintaining a preselected flow of gas from said central chamber (58) to a location spaced from said first end portion (24) of said body (12); and

means (46) for controllably delivering a preselected amount of liquid onto said expansion element (44), said means (46) including a delivery orifice (48) positioned in said central chamber (58) and spaced a preselected distance (D) from said periphery (66) of said central chamber (58) at the opening of said aperture (52) onto said wall (64) and oriented for directing said delivered liquid through said central chamber (58) into said aperture (52) to a preselected location on said expansion element (44).

4,393,299

ELECTRIC RADIANT HEATER UNIT FOR A GLASS CERAMIC TOP COOKER

Joseph A. McWilliams, Droitwich, England, assignor to Micropore International Limited, Droitwich, England

Filed Nov. 16, 1981, Ser. No. 321,634

Claims priority, application United Kingdom, Nov. 17, 1980, 8036864

Int. Cl.³ H05B 3/68

U.S. Cl. 219—446 6 Claims

1. An electric radiant heater unit for a glass ceramic top cooker, the heater unit comprising:

a base layer of electrical and thermal insulating material;

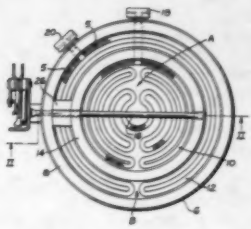
at least first and second bare heater elements positioned on said base layer and arranged such that said second heater element extends substantially entirely around the periphery of said first heater element;

means to connect said heater elements to a power source;

means for energising said first heater element independently of said second heater element;

a dividing wall of thermal insulating material positioned on said base layer and arranged between said first and second heater elements for keeping heat within said dividing wall; and

a peripheral wall of thermal insulating material positioned



on said base layer and surrounding said second heater element for keeping heat within said peripheral wall,

wherein said second heater element has an electrical resistance and said first heater element has an electrical resistance such that, in use of the heater unit, the electrical power fed to said second heater element and to said first heater element per unit surface area of the heater unit enclosed by the peripheral wall is greater than the electrical power fed to said first heater element per unit surface area of that part of the heater unit enclosed by the dividing wall.

4,393,300

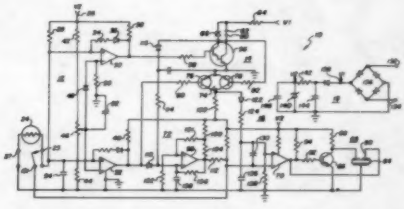
HEATING CONTROL SYSTEM

Gary R. Proctor, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 29, 1981, Ser. No. 316,056

Int. Cl.³ H05B 1/02

U.S. Cl. 219—497 9 Claims



1. A temperature detecting heating control system comprising:

a temperature sensor;

a first voltage comparator means having an output terminal and two input terminals;

first means for coupling said temperature sensor to one input terminal of said first comparator means;

a second voltage comparator means having an output terminal and two input terminals;

second means for coupling said temperature sensor to one input of said second comparator means;

means for generating a pair of dependently variable reference voltages, one of said reference voltages representing a variable set point temperature and being coupled to the other input terminal of said first comparator means, the

other of said reference voltages representing a warning temperature, which is a predetermined number of degrees less than said set point temperature, and being coupled to the other input terminal of said second comparator means;

current switching semiconductor means coupled to the output terminal of said first comparator means for controlling heating power in response to the temperature of said sensor reaching said set point temperature;

alarm means for producing a tonal alarm signal; and

means for controlling said alarm means in response to the temperature of said sensor, said means for controlling including means for causing said alarm means to produce an intermittent alarm signal in response to the temperature of said sensor being between said warning temperature and said set point temperature and a constant alarm signal for a predetermined period of time in response to the temperature of said sensor reaching said set point temperature,

said means for causing including third voltage comparator means having two input terminals and an output terminal coupled to control said alarm means,

said means for causing also including low frequency oscillator means coupled between said second comparator means output terminal and one input terminal of said third comparator means for intermittently activating said alarm means and having disabling means coupled to said first comparator means output terminal for disabling said oscillator means when said temperature of said sensor reaches said set point temperature,

said means for causing also including gate means for enabling activation of said alarm means only when the temperature of said sensor is between said warning temperature and said set point temperature,

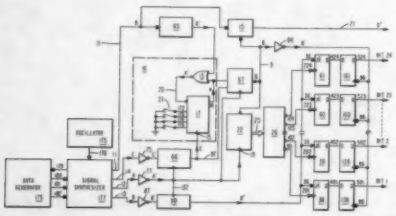
said means for causing further including means coupled to said third comparator means other input terminal for maintaining activation of said alarm means for said predetermined time period after the temperature of said sensor reaches said set point temperature.

4,393,301

SERIAL-TO-PARALLEL CONVERTER

Gordon D. Svendsen, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 5, 1981, Ser. No. 240,632
Int. Cl.³ G06F *5/04*
U.S. Cl. 377—56 **11 Claims**



1. A serial-to-parallel converter receiving respectively serial clock pulses, serial data bits synchronous with the serial clock pulses, a selected number of consecutive serial data bits forming a serial input word, said converter further receiving serial word synchronizing pulses synchronous with said serial input words, said converter comprising in combination:

(a) a means for receiving said serial word synchronizing pulses and generating a parallel clock pulse in response to an integer number of serial word synchronizing pulses and synchronously therewith;

(b) a counter means having an input for receiving said serial clock pulses and an output for synchronously providing a respective count in response to each received serial clock pulse, said counter means coupled to be reset by said parallel clock pulse;

(c) a decoder means having an input for receiving said count provided by said counter means and having a plurality of separate outputs each coupled to provide a separate output signal in response to each count and synchronously therewith;

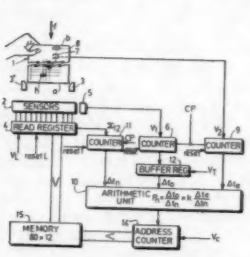
(d) a plurality of output storage means each having a separate data input enable terminal coupled to one separate output of said decoder means and each having a separate data output terminal, said plurality of output storage means having interconnected data input terminals for receiving simultaneously said serial data bits and having interconnected data output enable terminals for receiving simultaneously said parallel clock pulse, respectively, each said output storage means being coupled to store one particular serial data bit received thereby coincidently with a particular separate output signal from said decoder means and said plurality of output storage means being coupled to apply simultaneously said stored data bits to said separate outputs in form of a parallel output word in response to and synchronously with receiving said parallel clock pulse.

4,393,302

APPARATUS AND METHOD FOR READING PUNCHED CARDS

Rolf L. Hofmann, Basel, Switzerland, assignor to Advanced Card Systems, Ltd., Basil, Switzerland

Filed Jan. 4, 1982, Ser. No. 336,599
Int. Cl.³ G06K *7/016*
U.S. Cl. 235—474 **13 Claims**



1. A method for reading punched cards having holes arranged in rows and columns, comprising the steps of:

(a) gravity feeding a card to a reading station, along a path parallel to the rows of perforations of the card,

(b) measuring the period of time Δt_o between the passage of the leading edge of the card and the passage of a particular hole, at a sensing position in the reading station,

(c) measuring the period of time Δt_n between the passages of the leading and trailing edges, respectively, of said hole and,

(d) computing ratio $\Delta t_o/\Delta t_n$ for determining the position of the column comprising said hole.

4,393,303

INTRACAVITY PHASE FRONT AND POWER CONTROL

James M. Spinhirne, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 4, 1981, Ser. No. 259,875
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **4 Claims**

1. An adaptive optical resonator comprising:

an optical gain medium;

means for exciting optical radiation within said gain medium;

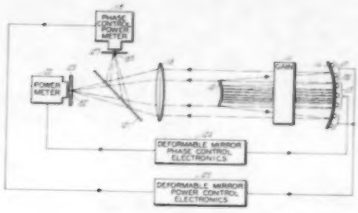
reflective means, including a deformable mirror, disposed

about said optical gain medium to form an unstable optical resonator for said radiation; and

feedback means, responsive to a portion of said outcoupled radiation, for controlling said deformable mirror, characterized in that:

said deformable mirror has a first region reflecting radiation within said resonator and a second region reflecting radiation out of said resonator;

said feedback means includes means for focusing a portion of said outcoupled radiation to a plurality of feedback focal


PHASE CONTROL POWER METER
POWER METER
DEFORMABLE MIRROR PHASE CONTROL ELECTRONICS
DEFORMABLE MIRROR POWER CONTROL ELECTRONICS

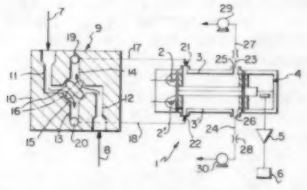
points, a first detector responsive to a first fraction of said portion of said outcoupled radiation falling within a predetermined aperture centered on one of said feedback focal points and connected to means for controlling said first region to maximize the power of said first fraction of radiation impinging on said first detector, and a second detector responsive to a second fraction of that portion of said outcoupled radiation directed at another of said feedback focal points and connected to means for controlling said second region of said deformable mirror to adjust the wave front of said outcoupled radiation.

4,393,304

GAS ANALYZER OF THE FLUID MODULATION TYPE

Kozo Ishida, and Hiroji Kohsaka, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 18, 1981, Ser. No. 235,739
Claims priority, application Japan, Mar. 1, 1980, 55-27076
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—343 **10 Claims**



1. In a gas analyzer of the fluid modulation type and including at least one cell, means for alternatively introducing a sample gas to be analyzed and a reference gas into said cell, detector means for analyzing a property of said sample gas, and means for alternately discharging said sample gas and said reference gas from said cell, the improvement comprising:

a critical flow device located in said discharging means; and

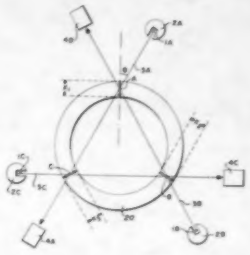
pump means, located in said discharging means, for operating said critical flow device under conditions of critical gas flow and for thereby maintaining said gas passing through said critical flow device and said cell at a constant flow rate.

4,393,305

METHOD OF TUBE WALL THICKNESS MEASUREMENT

Masami Shimizu, and Asao Monno, both of Kawasaki, Japan, assignors to Fuji Electric Company, Ltd., Japan

Filed Sep. 25, 1980, Ser. No. 190,800
Claims priority, application Japan, Sep. 26, 1979, 54-122642
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—358.1 **10 Claims**



1. A method of measuring values of single thickness of the wall of a tube having an axis comprising the steps of:

selecting at least four distinct measuring points within a sectional area of said tube wall, said sectional area being on a plane which is not parallel to the longitudinal axis of the tube;

selecting at least five radiation beam paths such that each of the paths passes through two of such measuring points and so that each of at least four measuring points is at an intersection of at least two different beam paths, so that at least two of said measuring points are on an intersection of more than two beam paths;

transmitting at least one radiation beam of known intensity along said paths;

detecting the intensities of said transmitted radiation beams, after having passed through said measuring points, to derive detected values each of which is indicative of a dual compound thickness of the tube wall;

processing said detected values to determine said radial thickness values of said wall, by solving a set of simultaneous equations so that at least two values of radial thickness are obtained for the particular measuring points having more than two measuring beam paths passing therethrough, and by mathematically obtaining the most probable value of solution for the radial thickness at each of those particular measuring points, wherein said most probable values of solution are used as the values of single radial thickness of the tube wall at said measuring points; and

wherein the number of measuring points and arrangement of beam paths are selected so that said set of simultaneous equations are solvable.

4,393,306

RADIATION DETECTOR

Brent T. Fultz, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 5, 1980, Ser. No. 213,276
Int. Cl.³ G01T *1/18*; H01J *47/00*
U.S. Cl. 250—374 **6 Claims**

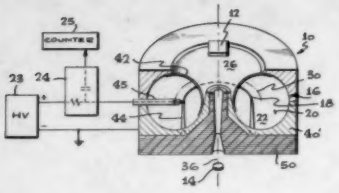
1. Apparatus for detecting ionizing radiation comprising:

a cathode which includes electrically conductive walls forming an annular chamber with a radially inner side and a radially outer side;

an anode extending in substantially a circle within said chamber;

a quantity of gas lying in said chamber; and

means for establishing an electrical potential between said cathode and anode;



said anode positioned so it lies closer to the radially inner side than the radially outer side of the cathode chamber.

4,393,307

NEUTRON DETECTORS

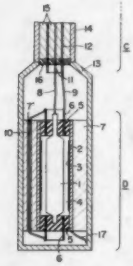
Shinichi Nozaki, Yokohama; Ichiro Tai, Tokyo, and Shimpey Shirayama, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 10, 1980, Ser. No. 205,613

Claims priority, application Japan, Nov. 15, 1979, 54-148189

Int. Cl.³ G01T *3/00*

U.S. Cl. 250—390 **2 Claims**



1. In a neutron detector of the type comprising an ionization chamber provided with an anode electrode and a cathode electrode for detecting neutron flux injected into said ionization chamber and a guide cable connected to said ionization chamber, said guide cable comprising a central conductor arranged within and coaxially with said cable and connected to one of said anode electrode and cathode electrode for deriving ionization current created by said neutron flux out of said ionization chamber, and an outer conductor extending coaxially with said central conductor and insulated therefrom, said outer conductor being connected to the other one of said anode and cathode electrodes, said outer conductor being electrically connected to a casing of said ionization chamber, the improvement which comprises an intermediate annular conductor arranged coaxially with and between said central and outer conductors of said cable and insulated therefrom, and upper and lower annular conductors embedded in insulating members disposed between said anode and cathode electrodes for supporting said one of the anode and cathode electrodes which is connected to said central conductor, said upper and lower annular conductors being electrically connected together and said upper annular conductor being connected to said intermediate annular conductor of said guide cable.

4,393,308

HIGH CURRENT ELECTRON SOURCE

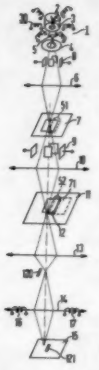
Klaus Anger, Munich; Juergen Frosien, Berlin; Burkhard Lischke; Erich Plies, both of Munich, and Klaus Tonar, Berlin, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,881

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010815

Int. Cl.³ H01J *37/00*

U.S. Cl. 250—396 R **6 Claims**



1. In a high current electron source having a narrow energy band and having a beam generating system including a cathode, a plurality of focusing electrodes, and a deflection system and an illumination lens disposed after said anode in the direction of electron beam travel, the improvement comprising:

one of said focusing electrodes being disposed between said cathode and said anode and consisting of non-movable means for generating an octupole effect on said electron beam, said means selectively varying the size of said cross-over and the orientation of said cross-over in a plane perpendicular to said electron beam.

4,393,309

METHOD AND APPARATUS FOR CONTROLLING THE OBJECTIVE LENS IN A SCANNING ELECTRON MICROSCOPE OR THE LIKE

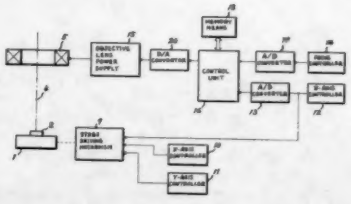
Setsuo Norioka, Akishimashi, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,009

Claims priority, application Japan, Sep. 12, 1980, 55-126812

Int. Cl.³ G21K *1/08, 5/10*; H01J *3/14*

U.S. Cl. 250—396 R **2 Claims**



1. A method for controlling the excitation current of the objective lens in a scanning electron microscope or the like comprising:

(a) a step for storing data which specify the relation between

the excitation current (I) of the object lens and the focusing distance (D) of the objective lens;

(b) a step for focusing the beam upon the specimen by varying the objective lens excitation current while observing the specimen image; and memorizing the initial focusing distance (D_o) corresponding to the objective lens excitation current determined by focusing;

(c) a step for detecting the change in the focusing distance (ΔD) due to the specimen shift relative to the initial focusing distance (D_o) along the optical axis of the objective lens after the said focusing operation;

(d) a step for reading out the excitation current corresponding to the focusing distance ($D_o+\Delta D$) from the data stored in step (a); and

(e) a step for supplying the objective lens with the excitation current read out in step (d).

4,393,310

METHOD OF AND DEVICE FOR ADJUSTING A SHAPED-ELECTRON-BEAM WORKING DEVICE

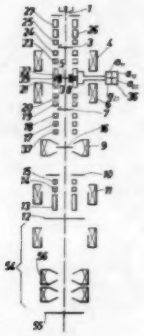
Eberhard Hahn, 9, Pestalozzistrasse, Jena, District of Gera, German Democratic Rep.

Filed Jan. 5, 1979, Ser. No. 502

Claims priority, application German Democratic Rep., Jan. 19, 1978, 01203296

Int. Cl.³ H01J 37/26

U.S. Cl. 250—398 **5 Claims**



1. A method of adjusting a shaped-electron-beam working device in which a first angular aperture is imaged onto the plane of a second angular aperture completing each other such that a rectangularly shaped beam results which is demagnified via an objective into a target plane and which is positioned therein through an x, y-deflection system, and in which a crossover of said shaped-electron-beam working device is imaged into the tilt plane of a format deflection system for format variation and from there onto the plane of an aperture diaphragm (entrance pupil) of said objective, adjustments of the pupil, of the beam format and of a beam format calibration being performed comprising in time sequence the steps of

displaying the electron beam shape image in the target plane on a screen,

displaying the image of the entrance pupil on the screen,

checking the images of said beam shape and said entrance pupil, and in the event of misalignments from an adjusted state prevailing

the following adjustment steps are performed:

imaging the aperture diaphragm and focusing of the pupil onto the plane of the aperture diaphragm for pre-adjustment of the pupil,

imaging of the target plane and cyclically positioning of a zero-format in x, y-deflection direction in the target plane in the step width of the zero-format and correcting the wedge error (non-parallel opposing sides), the parallelogram error, the distance error, and the brightness differences visible at the format edges of four adjacent edges of the zero-format for format adjustment where the zero-format is the cross-section of the beam in the currentless state of the format deflection system,

imaging of the aperture diaphragm and cyclic format variation, phase shifted in x, y-direction, and subsequent correction of the pupil displacement occuring in the course thereof, for pupil adjustment,

imaging of the target plane and cyclic positioning of the format with simultaneous format variation, and correction of the distance error visible at the format edges for format calibration.

4,393,311

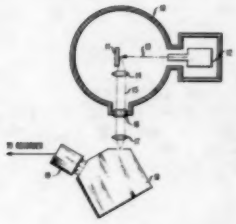
METHOD AND APPARATUS FOR SURFACE CHARACTERIZATION AND PROCESS CONTROL UTILIZING RADIATION FROM DESORBED PARTICLES

Leonard C. Feldman, Berkeley Heights; Joseph S. Kraus, Stirling; Norman H. Tolk, Mendham; Morton M. Traum, Warren, and John C. Tully, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 159,167, Jun. 13, 1980. This application May 21, 1982, Ser. No. 380,702

Int. Cl.³ G01N 23/22; H01J 37/26

U.S. Cl. 250—459.1 **43 Claims**



1. Method for analyzing a solid surface comprising

(a) exposing at least part of the surface to a beam of probe radiation of intensity and energy such that the exposed surface area remains solid;

(b) detecting responsive characteristic electromagnetic radiation in the infrared, visible, or UV part of the spectrum emitted by excited particles desorbed from the surface;

characterized in that

(c) the probe radiation consists of low-momentum radiation, "low-momentum radiation" being radiation that transfers negligible linear momentum to particles in the surface.

4,393,312

VARIABLE-SPOT SCANNING IN AN ELECTRON BEAM EXPOSURE SYSTEM

Robert J. Collier, New Providence, and Michael G. R. Thomson, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 655,427, Feb. 5, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,608

Int. Cl.³ H01J 37/00

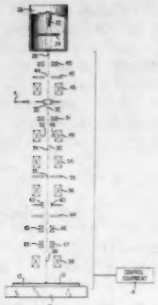
U.S. Cl. 250—492.2 **25 Claims**

1. A method for achieving variable-spot-size scanning of an electron beam in a lithographic exposure system adapted to fabricate microminiature devices, said method comprising the steps of

directing an image of a single electron-beam-illuminated aperture onto a mask plate which has a single aperture therethrough,

and successively controlling the registration of said image with respect to said second-mentioned mask plate aperture

during said scanning to establish plural different cross-sectional configurations of the beam that is transmitted



through said second-mentioned mask plate aperture thereby to selectively define variable spot sizes during said scanning.

4,393,313

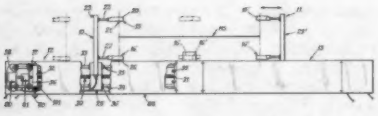
WIDTH DETECTOR SYSTEM

James D. Calkins, Oak Brook Terrace; Eugene E. Bushong, Bensenville, and Lee R. Schuck, Buffalo Grove, all of Ill., assignors to Binks Industries, Inc., Wood Dale, Ill.

Filed Apr. 29, 1981, Ser. No. 258,738

Int. Cl.³ G01N *21/86*

U.S. Cl. 230—560 **9 Claims**



1. A width detector system for constantly monitoring and measuring the width of moving elongated strip materials, comprising: a pair of carriages, one movably mounted adjacent each lateral edge of a strip of material to be measured; a pair of sensor means mounted, one on each carriage, for movement therewith along parallel paths transversely of the elongated axis of said strip material; each sensor means comprising a light source and a photo sensitive cell disposed on opposite faces of said strip material and productive of signals proportional to the intensity of light received by said cell; a pair of drive means, one for bidirectionally moving each carriage and sensor means; a pair of pulse generators, one operatively driven by each drive means, and operable to generate positive and negative output signals dependent on the direction of travel of said carriages along said paths; control means responsive to signals from each sensor means for controlling its associated said drive means whereby to cause each sensor means to independently follow an adjacent edge of said material, and measurement means responsive to the combined output signals of said generators for constantly monitoring the distances of said sensor means from a fixed datum including means for totalizing said distances whereby to determine the measured distance between said sensor means representing the width of said material.

4,393,314

CIRCUIT ARRANGEMENT FOR THE GENERATION OF A SAWTOOTH VOLTAGE

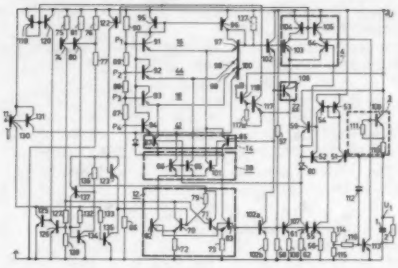
Dieter Kunze, Kaltenkirchen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,774

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949066

Int. Cl.³ H03K *4/08*

U.S. Cl. 307—228 **13 Claims**



1. Circuit arrangement for the generation of a sawtooth voltage at a capacitor, which is charged by a first current, until a first threshold voltage is reached, and is discharged by a second current, until a second threshold voltage is reached comprising:

a source of synchronization signals,

means for changing the direction and/or the intensity of the direct current supplied to the capacitor at the instant the threshold voltage is reached, whereby the differences between the first and the second threshold voltage as well as the charge and the discharge current determine the natural frequency of the sawtooth voltage generated, and

a synchronization signal detector and means for switching said circuit from said natural frequency under the influence of said synchronization signal detector for establishing the presence of said synchronization signal, whereby at least one of the two capacitor charge switching instants can be determined by synchronization signals supplied having a substantially constant nominal repetition frequency, the sawtooth voltage being thus synchronizable by said synchronization signals, and whereby said natural frequency is given substantially the nominal value in the absence of synchronization signals, said synchronization signal detector being implemented as a coincidence circuit to which a signal corresponding to a determined time interval, of the sawtooth voltage and a signal corresponding to a determined time interval of the incoming synchronous signal are supplied and which on coincidence of these two signals supplies a signal to a switching stage for switching the natural frequency of the sawtooth circuit arrangement from a value corresponding at least substantially to the nominal frequency to a lower value.

4,393,315

HIGH-GAIN STABILIZED CONVERTER

Tedd K. Stickel, Chalfont, and Stephen A. Ransom, Huntingdon Valley, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,898

Int. Cl.³ H03K *5/00, 19/092*

U.S. Cl. 307—264 **13 Claims**

1. A high-gain level converter for employing emitter coupled logic (ECL) source signals as an input to gallium arsenide (Ga As) logic circuitry, comprising:

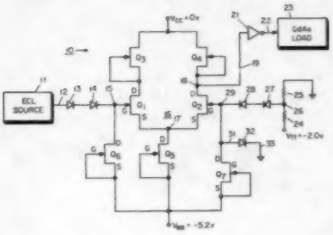
a first plurality of Ga As level shifting diodes couplable to said ECL source signals,

an input node line coupled to the output of said first plurality of diodes,

a voltage source,

a Ga As differential amplifier of the type comprising at least three transistors arranged as an active input transistor, a reference input transistor and a current source transistor couplable to said voltage source,

said input node line being connected to the gate of said input transistor of said differential amplifier,



a voltage divider having an intermediate voltage tap whose output voltage is approximately equal to the mid-point switching voltage of said ECL source signals,

a second plurality of Ga As level shifting diodes having an input coupled to said intermediate voltage tap of said voltage divider,

an output node line coupled to the output of said second plurality of diodes, and

said output node line being connected to the gate of said reference input transistor to provide an inverted output at the drain of said reference input transistor to provide a Ga As output voltage line compatible with the input voltage swings required for Ga As logic circuitry.

4,393,316

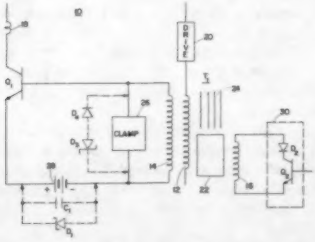
TRANSISTOR DRIVE CIRCUIT

Harold J. Brown, Lorain, Ohio, assignor to Reliance Electric Co., Cleveland, Ohio

Filed Mar. 11, 1981, Ser. No. 242,603

Int. Cl.³ H03K *3/45, 3/33*

U.S. Cl. 307—270 **16 Claims**



1. A bipolar transistor drive and control circuit comprising:

(a) a DC charge means directly coupled to said transistor for providing a source of charge for turn off of said transistor;

(b) a transformer having both a high permeability magnetic core and a low permeability linear magnetic core said transformer also having input and output drive current means said input drive means receiving a drive current signal and said output drive means being connected to both said charge means and said transistor; and

(c) turn off control winding means acting only on said high permeability core.

4,393,317

MAGNETICALLY CONTROLLABLE ELECTRONIC SWITCH

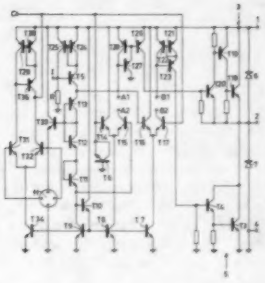
Wolfgang Radziwill, Aachen; Günter Döring, Würselen, both of Fed. Rep. of Germany, and Hans Steinbusch, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,103

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939917

Int. Cl.³ H03K *3/26*

U.S. Cl. 307—309 **16 Claims**



1. A magnetically controllable integrated circuit electronic switch comprising, a Hall element exhibiting an offset corresponding to a magnetic field having a value B_o and adapted to be controlled by a magnetic field having a component B normal to the Hall element, first and second electric supply input terminals and an output terminal, first and second electric switching paths coupled between the first and second supply input terminals and the output terminal, respectively, with each of said switching paths exhibiting a threshold $(\Delta B/2) \geqq 0$, and means including said Hall element for controlling said first and second switching paths so that exposure of the Hall element to said magnetic field with said normal component B causes the first switching path to be closed if $B > B_0 + (\Delta B/2)$ and the second switching path to be closed if $B < B_0 - (\Delta B/2)$, and wherein the first and second switching paths are both open if $|B - B_0| < (\Delta B/2) \times \Gamma$, wherein $0 < \epsilon < 1$ and Γ is a factor taking into account the transition between open and closed conditions of said switching paths.

4,393,318

SAMPLE AND HOLD CIRCUIT

Masayuki Takahashi, Utsunomiya; Kunihiko Goto, Kawasaki; Hisami Tanaka, Yokohama, and Michinobu Ohhata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 30, 1980, Ser. No. 154,949

Claims priority, application Japan, Jun. 1, 1979, 54/68552

Int. Cl.³ H03K *17/687;* **G11C** *27/02*

U.S. Cl. 307—353 **10 Claims**

1. A sample and hold circuit, for holding a sampled input voltage, comprising:

an input terminal;

an output terminal;

a first field-effect transistor, connected between said input terminal and said output terminal, for sampling an input voltage applied to said input terminal;

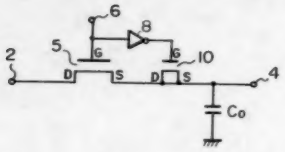
means for applying a first control voltage to the gate of said first field-effect transistor for selectively switching said

first field-effect transistor between conductive and non-conductive states,

a holding capacitor, connected to said output terminal, for holding said sampled input voltage;

means operatively connected to the gate of said first transistor for receiving and inverting the first control voltage and outputting the inverted voltage as a second control voltage;

a second field-effect transistor having a source and drain commonly connected to said output terminal and a gate connected to said inverting means and receiving said second control voltage for selectively switching said



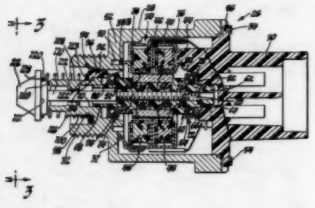
second field-effect transistor between non-conductive and conductive states, relative to the conductive and non-conductive states, respectively, of said first field-effect transistor, wherein the sum of the capacitance between the gate and source plus the capacitance between the gate and the drain of said second field-effect transistor is approximately equal to the capacitance between the gate and the source of said first field-effect transistor, and the area of the channel region, defined by multiplying the channel length L times the channel width W, of said second field-effect transistor is approximately equal to half of the area of the channel region of said first field-effect transistor.

4,393,319

ELECTRIC MOTOR POWERED ACTUATOR

Gustavus P. Bock, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1980, Ser. No. 214,199
Int. Cl.³ H02K *7/06*
U.S. Cl. 310—80 **8 Claims**



1. An electric motor powered actuator comprising in combination;

a shaft axially movable between an extended and stopped position and varying retracted positions,

a motor rotor telescoped on said shaft and in threaded relation therewith to position the shaft in accord with rotation of the rotor,

a first thrust bearing effective to oppose movement of the rotor in the retraction direction when the shaft is in extended and stopped position,

a second thrust bearing, one side of which engages said rotor, effective to oppose movement of the rotor in the extended direction, and

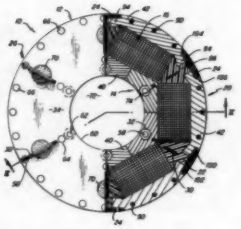
resilient means effective to exert a resilient expanding force between the shaft and an opposite side of said second thrust bearing to aid the motor in moving the shaft in the extended direction and to take up any last motion between the second thrust bearing and the rotor.

4,393,320

PERMANENT MAGNET ROTOR

Gordon K. Anderson, Tustin, Calif., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,703
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **3 Claims**



1. A permanent magnet rotor comprising:

an electrically conductive, non-magnetic housing including an annular front plate and an annular back plate, and defining a central, rotor axis;

an inner ring secured within the housing between the front and back plates and annularly extending around the rotor axis;

a plurality of permanent magnets supported within the housing and circumferentially spaced around the inner ring;

an outer ring secured within the housing between the front and back plates and circumferentially extending around the permanent magnets, and including a plurality of outer ring segments;

wherein the front and back plates, the permanent magnets, and the outer ring define a plurality of pockets;

electrically non-conductive filler material filling each of the pockets;

a plurality of electrically conductive, non-magnetic damper plates located radially outward of the filler material, engaging the front and back plates, and engaging and extending between adjacent outer ring segments; and

means securing the damper plates within the housing and including:

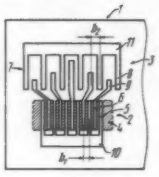
a plurality of front rivets, each front rivet being integral with one of said damper plates, extending forward therefrom, through the front plate and including a front head portion located forward of and overlaying a portion of the front plate, and

a plurality of back rivets, each back rivet being integral with one of said damper plates, extending rearward therefrom, through the back plate and including a back head portion located rearward of and overlaying a portion of the back plate.

4,393,321
SURFACE ACOUSTIC WAVE TRANSDUCER

Alexandr S. Bagdasarian, ulitsa Popova, 10, kv. 12, Moskovskaya oblast, Fryazino; Jury V. Gulyaev, ulitsa Baikalskaya, 23, kv. 29; Vladimir N. Fedorets, Ryazansky prospekt, 95, korpus 4, kv. 66, both of Moscow, and Anatoly M. Kmitz, prospekt Mira, 22, kv. 231, Moskovskaya oblast, Fryazino, all of U.S.S.R.

PCT No. PCT/SU80/00147, § 371 Date May 28, 1981, § 102(e) Date May 22, 1981, PCT Pub. No. WO81/00939, PCT Pub. Date Apr. 2, 1981
PCT Filed Aug. 27, 1980, Ser. No. 269,019
Claims priority, application U.S.S.R., Sep. 28, 1979, 2821084
Int. Cl.³ H01L 41/10
U.S. Cl. 310—313 B 5 Claims

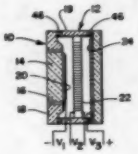


1. An interdigital surface acoustic wave transducer comprising a substrate of a material in which surface acoustic waves may be propagated and at least two rows of electrodes are laid down on the substrate, a main row of said rows comprising a first group of electrodes arranged in parallel with one another and connected electrically to a first current-conducting pad, and a second group of electrodes arranged in parallel with said electrodes of said first group, said electrodes of said first group being positioned in corresponding spaces between adjacent electrodes of the second group so that overlap regions of the electrodes of the groups are formed, said overlap regions having a constant length, said electrodes of said second group being connected to a second current-conducting pad, a second row positioned between said main row and said second current-conducting pad and comprising a first group of electrodes arranged in parallel with one another and electrically connected to said second current-conducting pad, and also comprising a second group of electrodes arranged in parallel with said electrodes of said first group in said second row and arranged between the electrodes of said first group in a manner such that at least some of the electrodes of said first and second groups of the second row form overlap regions of a variable length, said length being determined by a given impulse response of the transducer, said electrodes of said second group of said second row being coupled conductively and in a direct way to the corresponding electrodes of the second group of the main row, wherein the improvement comprises the substrate comprising at least first and second areas, the first area having and the second area having no piezoelectric properties, the main row having electrodes arranged on the first area of the substrate having piezoelectric properties, and the second row having electrodes arranged on the second area of the substrate having no piezoelectric properties.

4,393,322
IMAGE INTENSIFIER FACEPLATE

Walter P. Siegmund, Woodstock, Conn., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Aug. 15, 1980, Ser. No. 178,317
Int. Cl.³ H01J 43/28
U.S. Cl. 313—544 4 Claims

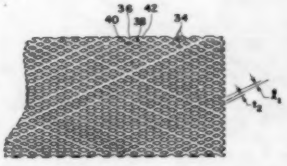


1. A faceplate for an image intensifier comprising the fused assembly of:
a central glass plate having a finished edge;
a ring of light-absorbing glass extending about said edge of said central plate; and
an outer annular supporting flange of glass.

4,393,323
FLUORESCENT LAMP SHIELD

Fritz Hübner, Zeeland, Mich., assignor to Plascore, Inc., Zeeland, Mich.

Filed Jan. 23, 1981, Ser. No. 227,965
Int. Cl.³ H01J 5/16; H01K 1/28
U.S. Cl. 313—110 5 Claims



1. An assembly for shielding a fluorescent light tube, comprising:
an elongated plastic, tubular shield having an inner peripheral surface;
an elongated, one-piece expanded metal tubular shaped heat sink positioned within the shield and adjacent the inner

peripheral surface of the shield, said heat sink defining a plurality of rows of apertures; and

a pair of end caps positioned one at each end of said shield, said end caps including means for receiving the ends of said shield to support the assembly about the light tube.

4,393,324

SPARK PLUG WITH A SPHERE-LIKE METAL CENTER ELECTRODE AND MANUFACTURING PROCESS THEREOF

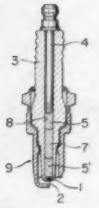
Kanemitsu Nishio, Komaki; Shunichi Takagi, Tajimi, and Yasuhiko Suzuki, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Nagoya, Japan

Filed Sep. 10, 1980, Ser. No. 185,956

Claims priority, application Japan, Sep. 14, 1979, 54-118046

Int. Cl.³ H01T *13/20, 13/32*

U.S. Cl. 313—133 **25 Claims**



1. A spark plug comprising a refractory insulator with a center bore having a bottom end provided with a small end bore being smaller than the remainder of the center bore and a discharge center electrode fixed to said small end bore by means of pressing a metallic sphere having a higher melting point than a sealing temperature of a conductive sealing glass in said small end bore.

4,393,325

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH MERCURY AMALGAM

Auke G. van der Kooi, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

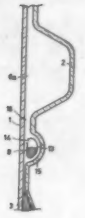
Filed Jul. 24, 1980, Ser. No. 171,692

Claims priority, application Netherlands, Aug. 15, 1979, 7906203

Int. Cl.³ H01J *61/28, 61/30*

U.S. Cl. 313—552 **3 Claims**

1. A low-pressure mercury vapor discharge lamp comprising a hollow glass inner member which is closely surrounded with a discharge-tight fit by a predominantly cylindrical, glass outer member, one end of each member being closed, the two members being sealed together in a gas-tight manner at their ends, the lamp also comprising two electrodes between which a discharge takes place during operation, said discharge being present in a discharge space between the electrodes formed by a groove in the wall of at least one of the members and by the wall portions of the other member, located opposite this groove, characterized in that intermediate the sealed edge and the discharge space there is a mercury amalgam present on or adjacent to a wall portion which is not in but is accessible to



the discharge space via a channel defined by facing surfaces of the two members.

4,393,326

DC PLASMA DISPLAY PANEL

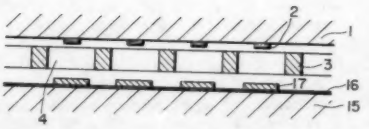
Takeo Kamegaya, Tokyo, and Satoshi Watanabe, Saitama, both of Japan, assignors to Okaya Electric Industries Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1981, Ser. No. 236,379

Claims priority, application Japan, Feb. 22, 1980, 55-21789; Feb. 22, 1980, 55/21790; Jan. 12, 1981, 56/2838

Int. Cl.³ H01J *61/06*

U.S. Cl. 313—582 **11 Claims**

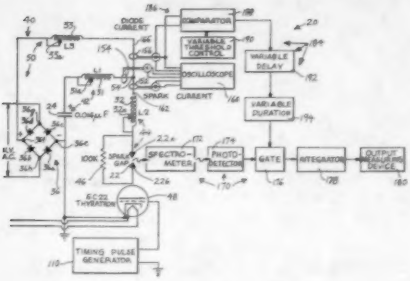


1. A DC plasma display panel comprising first and second substrates defining a gas chamber therebetween; an ionizable gaseous medium within said chamber; an anode layer formed onto said first substrate; a cathode layer formed onto said second substrate; an emitter layer formed onto said cathode layer; said cathode layer, said emitter layer, and said anode layer being disposed within said chamber for ionizing said gaseous medium; said emitter layer being formed onto said cathode layer by plasma spray coating.

4,393,327
ELECTRIC SPARK TYPE LIGHT SOURCE FOR PRODUCING LIGHT FOR SPECTROSCOPIC ANALYSIS

John P. Walters, and Steven G. Barnhart, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 29, 1981, Ser. No. 287,894
Int. Cl.³ H05B 7/20; G01J 3/30
U.S. Cl. 315—241 R 33 Claims



1. An electric spark type light source for producing light for spectroscopic analysis, comprising

an analytical spark gap,

an energy storage capacitor,

a charging and discharging circuit for alternately charging said capacitor and causing said capacitor to discharge across said spark gap to produce sparks which generate light for spectroscopic analysis,

said circuit including at least one inductance coil for causing the discharge current through said spark gap to be oscillatory and pulsating in waveform,

said circuit including rectifier means for causing the discharge current through said spark gap to have at least a unidirectional component,

and time gate pulse generating means for deriving time gate pulses from said circuit with said time gate pulses synchronized with the oscillatory pulsating waveform of the spark gap current for use in selecting repetitive segments of the light from said sparks for use in spectroscopic analysis.

4,393,328
HOT CATHODE, ITS PRODUCTION PROCESS AND ELECTRON TUBE INCORPORATING SUCH A CATHODE

Arvind Shroff, and Pierre Palluel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 5, 1980, Ser. No. 204,176
Claims priority, application France, Nov. 9, 1979, 79 27715
Int. Cl.³ H01J 1/14
U.S. Cl. 313—346 R 4 Claims

1. A process for producing a cathode formed from a matrix of a fritted powder metal impregnated with a barium compound, and a heating filament associated with said matrix, wherein the matrix is formed from a mixture of two metals, tungsten and another high work function refractory metal, and wherein the matrix is covered with a high work function refractory metal film, comprising the following successive stages:

(a) mixing powders of tungsten and another high work function refractory metal

(b) pressing the mixture between 7 and 10 t/cm²

(c) prefritting under hydrogen at between 1100° and 1300° CB for approximately 12 h

(d) fritting in vacuo at a temperature between 1850 and

(e) impregnation with calcium and barium aluminates

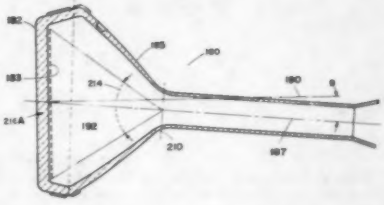
(f) elimination of the excess aluminate present on the surface by a chemical process

(g) deposition of the high work function refractory metal film.

4,393,329
ARTICLE OF MANUFACTURE FOR PROJECTION TELEVISION SYSTEM

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 110,413, Jan. 7, 1980, Pat. No. 4,274,110. This application May 29, 1980, Ser. No. 154,197
Int. Cl.³ H01J 29/86
U.S. Cl. 313—477 R 10 Claims



1. For use in a projection television system, an article of manufacture comprising a cathode ray picture tube having a face panel with a rearwardly extending skirt and a window for receiving a cathodoluminescent imaging screen, said tube having a seal land which defines a plane whose normal makes a non-zero acute angle with respect to the axis of said window.

4,393,330
METHOD FOR EFFECTIVELY CONTACTING MANGANESE-ACTIVATED ZINC SILICATE PHOSPHOR WITH ANTIMONY OXIDE DURING PHOSPHOR COATING, AND RESULTING LAMP

Henry Skwirut, Verona, and Robert G. Young, Nutley, both of N.J., assignors to North American Philips Electric Corp., New York, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,494
Int. Cl.³ H01J 61/48; B05D 1/38, 7/22
U.S. Cl. 313—487 25 Claims

1. A fluorescent lamp having a predetermined correlated color temperature and combined high efficacy and good color rendition, said lamp comprising a sealed elongated light-transmitting envelope having electrodes operatively positioned therein proximate the ends thereof and enclosing a discharge-sustaining filling comprising mercury and a small charge of inert ionizable starting gas which when energized generates a discharge comprising ultraviolet radiations and a limited proportion of visible radiations, phosphor means comprising a predetermined amount of a first phosphor layer carried on the inner surface of said envelope and a predetermined amount of a second phosphor layer coated on and carried on said first phosphor layer so that said second phosphor layer is positioned nearer to said discharge than said first phosphor layer;

said first phosphor layer principally comprising finely divided apatite-structured calcium halophosphate activated

by predetermined proportions of antimony and manganese, said first phosphor layer when excited by said discharge, emitting visible radiations of a color which approximates said predetermined correlated color temperature of said lamp, said first phosphor layer having been applied in predetermined amount by flowing over the envelope interior surface a phosphor coating paint comprising a liquid vehicle and organic binder having said first phosphor suspended therein as a slurry, said coating paint also including a small predetermined amount of finely divided antimony oxide, and said applied coating paint having been lehred at a temperature sufficient to volatilize the organic binder therefrom but insufficient to volatilize more than a minor proportion of said antimony oxide; and said second phosphor layer substantially comprising a mixture of predetermined amounts and relative proportions of finely divided narrow-band blue-emitting phosphor activated by divalent europium having an emission substantially confined to the wavelength range of from 430 nm to

485 nm, finely divided green-emitting phosphor comprising manganese-activated zinc silicate, and finely divided red-orange-emitting trivalent-europium-activated yttrium oxide, the predetermined amounts and relative proportions of said mixed phosphors comprising said second phosphor layer when excited by said discharge emitting visible radiations of a color which approximates said predetermined correlated color temperature of said lamp, said second phosphor layer having been applied in predetermined amount by flowing over said lehred first phosphor layer a second phosphor coating paint comprising a liquid vehicle and organic binder having said phosphors of said second layer mixed and suspended therein as a slurry, and said second layer applied coating paint having been lehred at a temperature sufficient to drive organic binder therefrom and also sufficient to volatilize an appreciable portion of residual antimony oxide in said first phosphor layer to cause said volatilized antimony oxide to contact said manganese-activated zinc silicate.

4,393,331

HIGH PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH OUTER BULB

Alexander Dobrusskin, Taufkirchen; Lutz Klein, Scheuring, and Günter Woizan, Munich, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,071

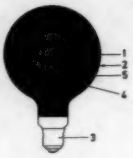
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 8010444[U]

Int. Cl.³ H01J *1/62, 61/40*

U.S. Cl. 313—489 **3 Claims**

1. An improved high pressure mercury vapor discharge lamp comprising an inner arc tube which radiates light with electric leads attached thereto surrounded by an outer transparent bulb, the inner surface of said outer bulb being coated with a phosphor coating and the outer surface of said outer bulb being coated with a luster filter coating,

the improvement comprising said phosphor coating on said inner surface being a red-emitting phosphor coating and the luster filter coating on said outer surface being an orange luster whose transmittance at 400 nm is about 40%,



at 500 nm is about 60%, and at 600 nm is about 70%, whereby said lamp radiates light having a color similar to that of an incandescent lamp with a color temperature of about 2,800° K.

4,393,332

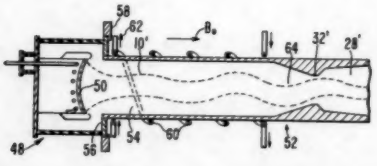
GYROTRON TRANSVERSE ENERGY EQUALIZER

Robert S. Symons, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 5, 1980, Ser. No. 184,497

Int. Cl.³ H01J *25/00*

U.S. Cl. 315—4 **7 Claims**



1. A gyrotron electron tube comprising:

means for generating a beam of electrons parallel to an axis; and

periodic means for causing all electrons in said beam to gain approximately the same transverse energy, said periodic means including means for generating a steady field component perpendicular to said axis whose direction rotates about said axis as a periodic function of distance along said axis.

4. A method for operating a gyrotron electron tube comprising means for forming a beam of electrons parallel to an axis, said method comprising the steps of applying a steady periodic field component perpendicular to said axis whose direction rotates about said axis as a periodic function of distance along said axis, and correlating the strength and axial length of said periodic field so that all electrons in said beam at different initial distances from said axis acquire approximately the same transverse energy.

4,393,333

MICROWAVE PLASMA ION SOURCE

Noriyuki Sakudo, Ohme; Katsumi Tokiguchi, Hachioji; Hidemi Koike, Tokorozawa; Ichiro Kanomata, Fuchu, and Humihiko Nakashima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 215,064

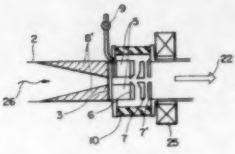
Claims priority, application Japan, Dec. 10, 1979, 54-169847[U]

Int. Cl.³ H01J *7/24;* **H05B** *31/26*

U.S. Cl. 315—111.81 **6 Claims**

1. A microwave plasma ion source comprising a source for

generating microwaves, a waveguide connected to said source for propagating the microwaves, a discharge chamber provided in an end portion of said waveguide to form a plasma therein by applying an electric field generated by the microwaves admitted thereinto and a magnetic field to a discharge gas introduced thereinto, ion extraction electrodes provided adjacent to said discharge chamber so as to extract ions from



the plasma, a solenoid provided on the low-voltage side of said ion extraction electrodes so as to form the magnetic field in said discharge chamber, and a high-permeability member arranged adjacent to slaid waveguide on the microwave admission side of said discharge chamber for permitting the microwaves to be propagated freely and for setting the shape of the magnetic field.

4,393,334

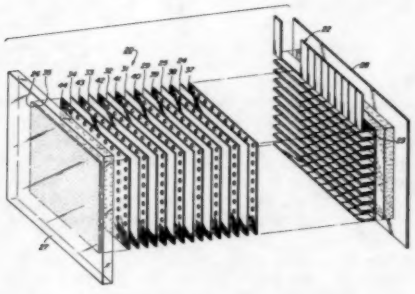
ELECTRON ACCELERATION IN IONIZABLE GAS

David Glaser, 1918 Raymond Dr., Northbrook, Ill. 60062

Filed Feb. 9, 1981, Ser. No. 232,972

Int. Cl.³ H05B *41/16*; H01J *61/62*

U.S. Cl. 315—167 **18 Claims**



1. In a gas-discharge device of the type having a generally planar cathode for emitting electrons and a generally planar anode for accelerating said electrons toward a luminescent target, said anode and said cathode being mutually parallel and the space between said cathode and said anode containing an ionizable gaseous atmosphere, the combination comprising

a plurality of planar electron-transmissive accelerator electrodes mounted in spaced parallel relationship between said cathode and said anode,

insulator means insulating said electrodes from one another and from said cathode and said anode, and permitting said electrons to pass as they travel from said cathode toward said target, and

means connecting to said electrodes voltages which are respectively positive relative to the voltage level of said cathode, which voltages increase in value from the one of said electrodes which is closest to said target,

the voltage difference between adjacent ones of said accelerator electrodes being less than the ionization voltage and the surface breakdown voltage therebetween,

said electron-transmissive accelerator electrodes are respectively provided with a plurality of holes through which said electrons must pass as they travel from said cathode to said anode, and

the minimum dimension of said holes being less than the Debye length of the gaseous atmosphere in which they are located.

4,393,335

ELECTRONIC FLASH DEVICE

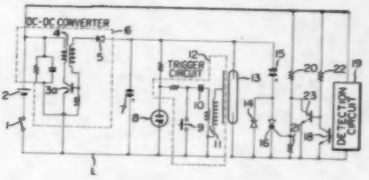
Shinji Hirata, Toyonaka, and Hirohiko Ina, Kobe, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Apr. 28, 1981, Ser. No. 258,301

Claims priority, application Japan, Apr. 28, 1980, 55-59007[U]; May 30, 1980, 55-75659[U]

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P **3 Claims**



1. An electronic flash device comprising

(a) a DC-DC converter which includes an npn type oscillation transistor and an oscillation transformer and which steps up a voltage across a low-voltage power source,

(b) a main flash capacitor charged by said DC-DC converter,

(c) a flash lamp which is connected across said main flash capacitor and which establishes a discharge-flash loop with said main flash capacitor,

(d) a trigger circuit which includes a trigger capacitor connected in parallel with said main flash capacitor and which excites said flash lamp,

(e) a diode whose anode is connected to the high-voltage-side terminal of said main flash capacitor,

(f) an auxiliary flash capacitor which is adapted to be charged through said diode by said DC-DC converter,

(g) a silicon controlled rectifier means which is connected across said diode in the opposite direction and which establishes a discharge loop of said auxiliary flash capacitor,

(h) a control circuit which is connected across said low-voltage power source and which controls the application of the gate signal to said silicon controlled rectifier means, said control circuit comprising:

(1) a drive circuit for delivering the gate signal to said silicon controlled rectifier means,

(2) a switching element which is connected across said low-voltage power source through a resistor and which is adapted to short-circuit the gate of said silicon controlled rectifier means, and

(3) a switching element control circuit for controlling said switching element, and

(i) a detection circuit which is adapted to control said control circuit in response to the exposure conditions.

4,393,336

REGULATION OF THE EHT VOLTAGE OF A CRT

Terrance C. Schmidt, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Apr. 2, 1981, Ser. No. 250,262

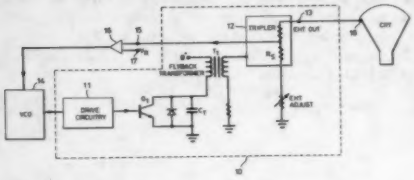
Claims priority, application United Kingdom, Dec. 23, 1980, 8041238

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—387 **1 Claim**

1. In combination with a cathode ray tube having an anode;

means for deriving and supplying EHT to said anode other than via horizontal deflection circuitry that supplies deflection current to the horizontal deflection coil for said cathode ray tube, said deriving and supplying means including a tuned flyback transformer producing flyback pulses; a voltage controlled oscillator; means for deriving an error signal indicative of a change in EHT both above and below a predetermined magnitude; means supplying said error signal to said voltage



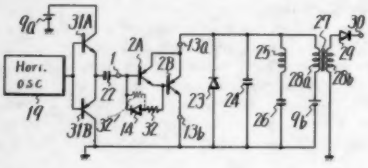
controlled oscillator to decrease the frequency of the output signal thereof in response to a decrease in EHT and to increase the frequency of the output signal thereof in response to an increase in EHT; and means utilizing said output signal to control the operation of said flyback transformer in such a way that the magnitude of said flyback pulses are increased in response to a decrease in EHT and decreased in response to an increase in EHT.

4,393,337

SWITCHING CIRCUIT

Tamiji Nagai, Kawasaki, and Takeshi Matsushita, Sagamihara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1979, Ser. No. 22,306
Claims priority, application Japan, Mar. 25, 1978, 53-34356
Int. Cl.³ H01J *29/70*; H01L *29/74*
U.S. Cl. 315—408 **10 Claims**



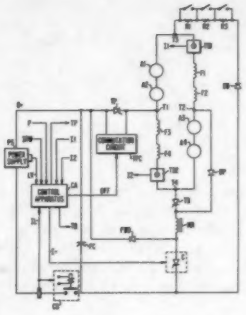
10. A horizontal deflection circuit for a television system comprising: a deflection coil; a fly-back transformer; a damper diode; a resonant capacitor; said deflection coil, fly-back transformer, damper diode and resonant capacitor being connected together and constituting a load; a horizontal oscillator producing a repetitive signal having first and second voltage levels; a switching circuit having an input terminal and first and second load terminals; said load being connected to said first and second load terminals; said switching circuit including a first three-junction gate-controlled switch having a first gate, a first anode and a first cathode and a second three-junction gate-controlled switch having a second gate, a second anode and a second cathode; said first gate being connected to said input terminal; said second cathode being connected to said first load terminal; said first and second anodes being connected to said second load terminal; said first cathode being connected to said second gate; means responsive to said first and second voltage levels for applying positive and negative signals to said input terminal; said first and second gate-controlled switches having ON and OFF conditions; and delay means for delaying a change of said second gate-controlled switch from said ON to said OFF condition until said first gate-controlled switch has completed a change from said ON to said OFF condition.

4,393,338

VEHICLE PROPULSION MOTOR CONTROL APPARATUS

Stanley W. Jones, McMurray, and James H. Franz, Jr., Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1981, Ser. No. 258,852
Int. Cl.³ H02P *3/00*
U.S. Cl. 318—86 **5 Claims**



1. In control apparatus for a plurality of direct current motors operative with a voltage source and an effort request signal for determining one of a power mode of operation and a brake mode of operation for said motors, with each of said motors having an armature and a field, the combination of:

circuit means having first and second terminals and a first circuit including the armature and field of a first motor and a second circuit including the armature and the field of a second motor connected between said first and second terminals, said circuit means having third and fourth terminals and a third circuit including the first motor armature and the second motor field and a fourth circuit including the first motor field and the second motor armature connected between said third and fourth terminals,

first switch means connected with said voltage source and controlling the current through said first and second circuits to establish said power mode, and

second switch means connected to control the current through said third and fourth circuits to establish the brake mode,

with the first switch means including a power diode connected to be conductive in a first direction and provided to conduct power mode current through the first and second motor armatures in said first direction, and with the second switch means including a brake diode connected to be conductive in a second direction and provided to conduct brake mode current through the first and second motor armatures in said second direction.

4,393,339

MOTOR APPARATUS

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,496
Claims priority, application Japan, Mar. 7, 1980, 55-28692
Int. Cl.³ H02K *29/00*
U.S. Cl. 318—254 **10 Claims**

1. A motor apparatus comprising:

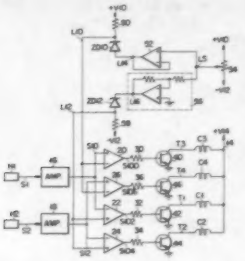
a motor including a rotor;

detection means coupled to said motor for providing a detection signals corresponding to a position of said rotor;

converter means coupled to said detection means for providing multiphase pulse signals by slicing off said detection signal at a predetermined threshold level, said multiphase

pulse signals being either high or low in level and overlapped with one another in the high level thereof; and

changing means coupled to said converter means for changing said threshold level;



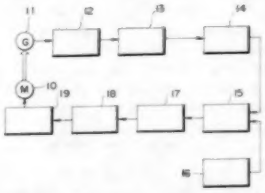
wherein the rotation speed of said rotor is controlled in accordance with said threshold level.

4,393,340

MOTOR SPEED CONTROL DEVICE

Teruo Iwasama, and Hitomi Tojiki, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,378
Claims priority, application Japan, Jun. 11, 1980, 55/78503
Int. Cl.³ H02P 5/16
U.S. Cl. 318—301 **4 Claims**



1. A motor speed control device, comprising:

means for generating pulse output corresponding to the revolution speed of the motor;

means for generating saw-tooth output in synchronization with the pulse output;

means for generating reference voltage;

a current mirror load differential amplifier including a first amplifier element having a first current mirror circuit connected as load and supplied with the saw-tooth wave output and a second amplifier element having a second current mirror circuit connected as load and supplied with the reference voltage, and supplying current to the first or second current mirror circuit corresponding to the result of comparing the reference voltage with the saw-tooth wave output;

an integrating circuit to be charged or discharged by the charging current flowing through one of the first and second current mirror circuits and the discharging current flowing through the other of both current mirror circuits; and

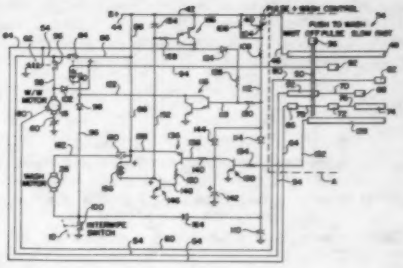
means for driving the motor by output of the integrating circuit.

4,393,341

WINDSHIELD CLEANING SYSTEM

James C. Byrne, Farmington Hills, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jun. 15, 1981, Ser. No. 273,495
Int. Cl.³ H02P 5/00
U.S. Cl. 318—443 **20 Claims**



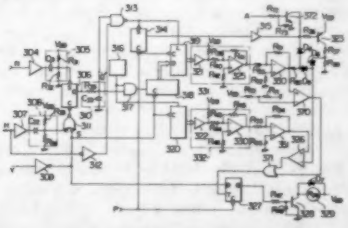
1. A windshield cleaning system comprising drivable windshield cleaing means including blade means and wash fluid pump means, first and second motor means for respectively driving said blade means and said pump means, motor control circuit means including power supply means and manually positionable means for connecting said motor means across said power supply means for providing a selected one of a plurality of selectable driving modes for said drivable means, said modes including a wash mode in which both said first and second motor means are connected across said power supply, said blade means and said pump means in said wash mode each having a corresponding operating period, said motor control circuit means including timing means operable in said wash mode for determining the duration of said operating period for said pump means independent of said operating period for said blade means in said wash mode, and means for adjusting said timing means for varying said duration of said operating period of said pump means in said wash mode.

4,393,342

DOOR OPERATION CONTROL APPARATUS

Shigeru Matsuoka; Takeshi Tokunaga; Seiji Yonekura; Koji Yamauchi, and Mitsuo Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,046
Claims priority, application Japan, Dec. 12, 1980, 55-174593
Int. Cl.³ G05B 5/00
U.S. Cl. 318—467 **12 Claims**



1. A door operation control system comprising a door operating device including a driving unit for driving a door and connector means for connecting said driving unit to said door, and a control unit for issuing a predetermined command signal to said door operating device to control movement of said

door, said control unit comprising counter means for counting the time of door operation, section detector means for counting the time of door movement from one end to the other end of a specified section of travel thereof, memory means for storing the count detected by said section detector means, means for producing a comparison reference value which is determined as a function of said count stored in said memory means, and means for comparing said count detected by said counter means with said comparison reference value and providing a command signal in the form of a door operating condition control signal to said door operating device when the count thereof exceeds said comparison reference value.

4,393,343

POSITION ADJUSTING DRIVE UNIT

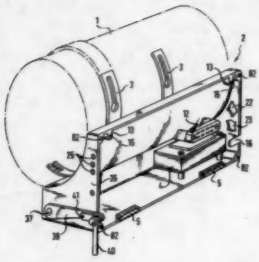
Wolfgang Angersbach, Darmstadt, and Karl-Heinz Meier, Zeilhard, both of Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 167,325

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930228

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—640 **5 Claims**



1. A position adjusting drive unit for a rotary shaft of a machine, particularly a sewing machine, comprising a driving electrical motor having an adjustable rotary speed; an electrical speed regulating circuit for said motor; an electrical angular position adjusting circuit for the rotary shaft of the machine; said circuits including means for generating signals corresponding to desired values of the rotary speed and of the angular position and to actual values of the rotary speed and of the angular position; a common circuit board detachably connected to the motor, said board supporting and interconnecting the electrical and mechanical component parts of said circuits; said means for generating electrical signals including a plurality of light barriers controlled by a stop plate having stop apertures arranged according to a code for generating a digital code of the desired value signals; and electrooptical signal generating-and-receiving means arranged in a modular unit; said modular unit including a plurality of light-emitting diodes arranged at different levels in a pack, a corresponding plurality of photo-transistors arranged at corresponding levels and at a spaced relationship from said light-emitting diodes, an intermediate partition extending in a part of the space between said diodes and phototransistors and having a free edge stepped according to the levels of said diodes, a stop plate slidable in the remaining interspace between said diodes and said phototransistors and having one edge thereof stepped in a complementary fashion relative to the stepped edge of said intermediate partition to provide adjustable stop apertures, and further including fixed stop apertures arranged at the level of respective steps; and said means for generating the desired value electrical signals including at least one light barrier controlled by a stop plate.

4,393,344

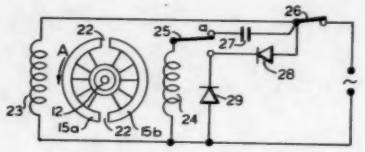
SQUIRREL CAGE INDUCTION MOTORS

Geoffrey E. Whellams, 3 Spruce Ave., Greenstead, Colchester, Essex, England

Division of Ser. No. 14,114, Feb. 22, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 168,684

Int. Cl.³ H02P *3/24*

U.S. Cl. 318—759 **10 Claims**



1. A squirrel cage motor of the single phase running type and control means therefor, which motor comprises a rotor and a stator, said rotor being arranged in the form of a core and a cage built up of two conductor end rings and conductor bars connecting said end rings, and said stator comprising a stator core carrying primary and secondary windings, in which motor at least one of said two conductor end rings of the rotor is provided with at least two gaps diametrically opposed to each other to divide said one end ring into at least two separate portions, said gaps serving an insulating sections between the separate end ring portions, and said control means comprising supply means to feed a single phase alternating current supply to said primary stator winding, switch means in series with said secondary stator winding and selectively operable between a run position and a stop position, a capacitor connected between the switch means and the alternating current supply means so as to be arranged in series with said secondary winding when said switch means is in the run position so that alternating current thereby flowing through the primary and secondary windings generates a polyphase field, and full wave rectifier means also connected between the switch means and the alternating current supply means so as to be arranged in series with said secondary winding when said switch means is in the stop position whereby direct current thereby flowing through the secondary winding causes the rotor to stop at an angular position determined by the disposition of said gaps in said one end ring.

4,393,345

CIRCUIT FOR DAMPING HUNTING BY ELECTRIC MACHINES

Kurt Fork, Neunkirchen; Wolfgang Kaufhold; Wolfgang Meusel, both of Erlangen, and Hermann Waldmann, Weiher, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 22, 1980, Ser. No. 199,685

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1979, 2945599

Int. Cl.³ H02H *7/06*; H02P *9/00*

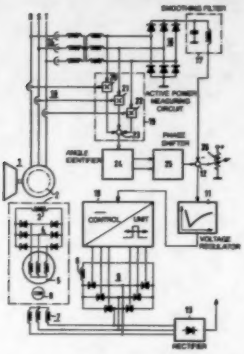
U.S. Cl. 322—19 **10 Claims**

1. A circuit for damping hunting oscillations of a controlled electric synchronous machine of the type having a rotor and a stator, the circuit being of the type which determines the hunting oscillation and combines a phase-shifted oscillation correction signal with a control signal of the circuit, the circuit further comprising:

identification circuit means for producing a first signal having a frequency which corresponds to a frequency of the hunting oscillation and a second signal having said frequency and shifted in phase by 90° with respect to said first signal;

phase shift means for forming the phase-shifted oscillation correction signal, said phase-shifted oscillation correction

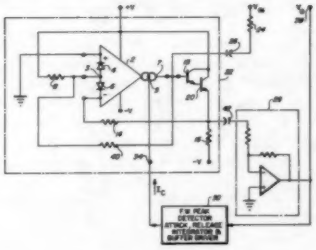
signal being shifted in phase with respect to said first and second signals by a selectable amount, said first and second signals being combined with one another in accordance with their respective amplitudes.



4,393,346
VOLTAGE CONTROLLED RESISTOR

Ronald R. Jones, Phoenix, Ariz., assignor to Circuit Research Labs, Tempe, Ariz.

Filed Jul. 6, 1981, Ser. No. 280,546
Int. Cl.³ G05F 1/46
U.S. Cl. 323—280 **11 Claims**



1. A voltage controlled resistor circuit, comprising:

an operational transconductance amplifier having an inverting input, a non-inverting input adpated to be coupled to a first source of supply voltage, a diode bias input, a bias input for receiving a gain control current, first and second power supply terminals adapted to be coupled to second and third supply voltages, respectively, and an output for exibiting a high output impedance when the gain control current is substantially zero, said output impedance decreasing as said gain control current increases, said operational transconductance amplifier having first and second linearizing diodes each having an anode coupled to said diode bias input, said first linearizing diode having a cathode coupled to said inverting input and said second linearizing diode having a cathode coupled to said non-inverting input;

first means coupled to said output for providing a low impedance buffered output;

first impedance means coupled to said diode bias input for producing current flow through said first and second linearizing diodes;

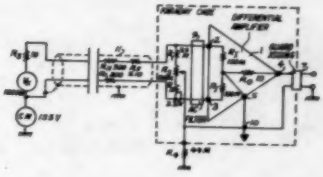
second impedance means coupled to said low impedance buffered output for providing feedback to said inverting input and for supplying and controlling bias current to said first linearizing diode; and

third impedance means coupled between said output and said diode bias input for maintaining bias to said first means when said output approaches open circuit output impedance conditions.

4,393,347
COMMON MODE VOLTAGE REJECTION CIRCUIT

Norman G. Looper, San Diego, Calif., assignor to Action Instruments Co. Inc., San Diego, Calif.

Filed Aug. 6, 1980, Ser. No. 175,800
Int. Cl.³ G01R 1/30; H03F 3/68
U.S. Cl. 324—126 **3 Claims**



1. In an electrical apparatus for measuring minute differential voltage levels between a first low-source-impedance signal applied to the apparatus positive input terminal and a second low-source-impedance signal applied to the apparatus negative input terminal in the presence of substantial common-mode voltages in reference to earth, wherein said apparatus has balanced high input impedances between each of said terminals and the apparatus zero-reference point, and wherein said zero-reference point is isolated from earth,

an improvement for limiting the effect of any unbalance between the input-path impedances of said signals which comprises:

a low-impedance shunt across each of the input terminals and the apparatus zero-reference point; and

a high-impedance shunt between the apparatus zero-reference point and earth;

wherein the value of said low-impedance shunt in relation to the high-impedance shunt is selected so as to attenuate the common-mode voltages without reducing the terminal input impedances in relation to the signal source-impedances to a point where the measurement error due to the signal source impedance is likely to be equal or greater than the measurement error due to the effect of the common-mode voltages in the absence of said low-impedance and high-impedance shunts.

4,393,348
METHOD AND APPARATUS FOR DETERMINING MINORITY CARRIER DIFFUSION LENGTH IN SEMICONDUCTORS

Bernard Goldstein; Joseph Dresner, both of Princeton, and Daniel J. Szostak, Mercerville, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,575
Int. Cl.³ G01R 31/26
U.S. Cl. 324—158 R **13 Claims**

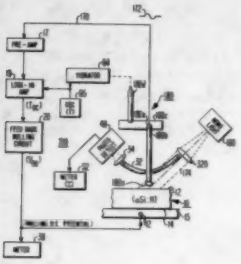
1. An apparatus for determining the minority carrier diffusion length of a sample of semiconductor material, the sample having two major surfaces, one of the surfaces arranged for illumination and the other surface shielded from illumination comprising:

(a) means for illuminating a portion of the one major surface of the sample with steady d.c. monochromatic light that is of a selected wavelength to provide a d.c. surface photovoltage (d.c. SPV);

(b) vibrating means positioned adjacent said illuminated

surface for providing an alternating electrical signal representing said d.c. SPV on the sample;

(c) electronic servo means responsive to said alternating electrical signal for automatically providing a nulling potential equal to said d.c. SPV; and



(d) means for providing a signal representing the illumination incident upon the sample by detecting a portion of said illuminating light.

4,393,349

ASYMMETRICAL SQUID

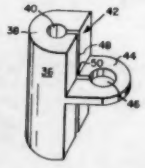
Max B. Burbank, Maple Ridge; Randy K. Lomnes; Jiri Vrba, both of Port Coquitlam, and Alistair A. Fife, Coquitlam, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed May 21, 1980, Ser. No. 151,815

Claims priority, application Canada, Jul. 26, 1979, 332608

Int. Cl.³ G01R *33/02;* H03K *3/38*

U.S. Cl. 324—248 **4 Claims**



1. A SQUID device for magnetic field measurements comprising a tubular body of superconducting material, said body being truncated longitudinally to provide a flat surface; a hole having a longitudinal axis which is coaxial with the longitudinal axis of said body; a slot having a longitudinal axis parallel with said longitudinal axis of said body and joining said hole and said flat surface; a coil of superconducting wire having ends centrally affixed to said flat surface and directly adjacent said slot, wherein the inductance of said coil is different than the inductance of said hole; and wherein a weak link is located in said slot adjacent said flat surface.

4,393,350

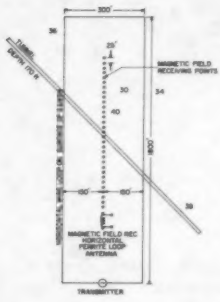
METHOD FOR RAPIDLY DETECTING SUBTERRANEAN TUNNELS BY DETECTING A NON-NULL VALUE OF A RESULTANT HORIZONTAL MAGNETIC FIELD COMPONENT

Peder M. Hansen; John G. Hoffman; Elwin W. Seeley, and Wesley A. Andrew, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 31,721, Apr. 20, 1979, Pat. No. 4,290,020. This application May 18, 1981, Ser. No. 264,754

Int. Cl.³ G01V *3/08*

U.S. Cl. 324—334 **2 Claims**



1. A method for rapidly detecting subterranean tunnels using primary magnetic fields generated by electrical conductors placed on the earth's surface in a manner such that the conductors are parallel and the lenghts thereof are several times greater than the distance separating them comprising the steps of:

generating two separate ac primary magnetic fields at a predetermined frequency in a manner that the resultant horizontal component of the magnetic fields along a preselected line on the earth's surface is a null when the surrounding region is characterized with homogeneous electromagnetic properties;

measuring said resultant horizontal component of the magnetic fields along said preselected line; and detecting the occurrence of a nonnull measurement as an indication of the location of a subterranean tunnel.

4,393,351

OFFSET COMPENSATION FOR SWITCHED CAPACITOR INTEGRATORS

Roubik Gregorian, Santa Clara, and Glenn Wegner, San Jose, both of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Jul. 27, 1981, Ser. No. 287,387

Int. Cl.³ G06G *7/18;* H03K *5/00;* H03F *1/02*

U.S. Cl. 328—127 **6 Claims**

1. An integrator containing an integrator input terminal and an integrator output terminal comprising:

an operational amplifier having an inverting input lead, a non-inverting input lead, and an output lead, said operational amplifier producing an offset voltage on said output lead;

a first switch means responsive to a first phase of a signal having two phases, said first switch means connected between said inverting input lead and said output lead;

a first capacitor, having a capacitance C_1, having a first and a second plate, said first plate connected to said inverting input lead of said operational amplifier;

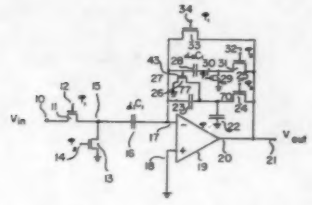
a second switch means, responsive to a second phase of said signal having two phases, said second switch means con-

nected between said second plate of said first capacitor and said output lead of said operational amplifier;

a second capacitor, having capacitance value $\alpha_2 C_1$, having a first and a second plate, said first plate connected to said inverting input lead of said operational amplifier;

third switch means, responsive to said second phase, said switch means connected between said second plate of said second capacitor and said output lead of said operational amplifier;

a fourth switch means, responsive to said first phase, said fourth switch means connected between said second plate of said second capacitor and a voltage reference; and



switched capacitor means connected between said inverting input lead and said integrator input terminal, said switched capacitor means serving as a resistor equivalent and including a third capacitor having a first and a second plate, said third capacitor having capacitance $\alpha_1 C_1$;

whereby the effect of said offset voltage on the integrator output voltage available on said output terminal is eliminated by the simultaneous integration of said input voltage and said offset voltage during the period when said first clock phase is low and said second clock phase is high.

4,393,352

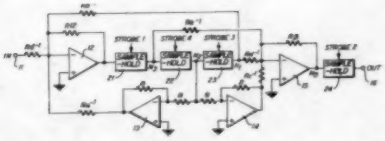
SAMPLE-AND-HOLD HYBRID ACTIVE RC FILTER

Gerald T. Volpe, Stamford; Leonard S. Laskoski, Bridgeport; Ralph J. Amodeo, Bethel; William J. Swanson, Danbury, and Jerome D. Gottesman, Norwalk, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 18, 1980, Ser. No. 188,429

Int. Cl.³ H03D *1/02*

U.S. Cl. 329—50 **6 Claims**



1. A circuit for eliminating a variable carrier frequency from an input data signal, comprising in combination,

filter means automatically tunable to provide a variable frequency reject band comprising first, second, third and fourth sample-and-hold circuits connected in tandem,

input means providing said input data signal to said first sample-and-hold circuit,

first means automatically tuning said filter means to vary the frequency reject band in accordance with variations in the carrier frequency to eliminate the carrier frequency from the input data signal,

said first means comprising strobe pulse generating means,

said strobe pulse generating means including second means causing the period of the strobe pulses to vary proportionately to variations in the carrier frequency,

third means connecting said strobe pulse generator means to said filter means to cause said first, second, third and fourth sample-and-hold circuits to be strobed first, fourth, third and second, respectively.

4,393,353

NEGATIVE FEEDBACK AMPLIFYING CIRCUIT HAVING VOLTAGE NEGATIVE FEEDBACK AND CURRENT NEGATIVE FEEDBACK CIRCUITS

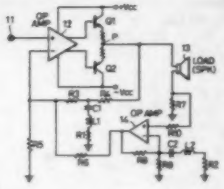
Hiroyasu Minagawa, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 26, 1980, Ser. No. 191,355

Claims priority, application Japan, Sep. 28, 1979, 54-134344[U]

Int. Cl.³ H03F *1/32*

U.S. Cl. 330—102 **6 Claims**



1. A negative feedback amplifying circuit comprising:

(a) an amplifier having positive and negative inputs, the output of said amplifier being coupled to a load comprising a speaker;

(b) a resistor connected in series with said speaker;

(c) a voltage negative feedback circuit for feeding back the output voltage of said amplifier to the negative input of said amplifier; and

(d) a current negative feedback circuit for feeding back a signal, which is a function of the potential difference between both the ends of said resistor, to the negative input of said amplifier, said voltage negative feedback circuit having a frequency selection characteristic having a dip at a specific frequency which is equal to the minimum resonance frequency due to the mechanical impedance of said speaker, and said current negative feedback circuit having a frequency selection characteristic having a peak at said specific frequency.

4,393,354

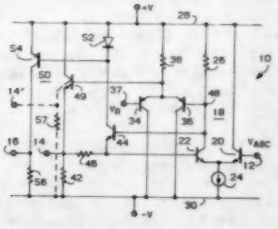
CROSSOVER CIRCUIT FOR USE IN AUTOMATIC GAIN CONTROL SYSTEMS

Michael McGinn, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,605

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—280 **18 Claims**



1. Circuit for providing output voltages indicative of the level of an applied input signal, comprising:

first circuit loop means which is responsive to the magnitude

of the input signal being less than that of a reference bias signal supplied to said first circuit loop means for providing an output indicative of the level of the input signal, said first circuit loop means being rendered nonresponsive when the magnitude of the input signal exceeds a threshold level set by said reference bias signal such that the output therefrom remains substantially constant; and

second circuit loop means coupled with said first circuit loop means which is rendered responsive by said first circuit loop means becoming nonresponsive for providing an output indicative of the level of the input signal.

4,393,355

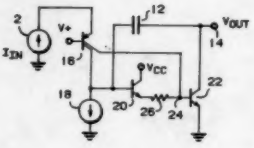
OPERATIONAL AMPLIFIER

William F. Davis, Tempe, and Stuart B. Shacter, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1981, Ser. No. 315,085

Int. Cl.³ H03F *3/04, 1/34*

U.S. Cl. 330—294 **3 Claims**



1. An operational amplifier having an output stage, said operational amplifier comprising:

an input stage for generating a drive signal;

first means coupled to said input stage and responsive to said drive signal for generating first and second currents, said first means comprising a transistor having first and second collectors;

follower transistor means coupled to said first means and having an input driven by said first current, said follower transistor means having emitter and collector terminals, and having a base terminal coupled to said first collector;

a gain transistor coupled to said follower transistor means and responsive to said first and second currents, said gain transistor having base, emitter and collector terminals, said base terminal coupled to the emitter of said follower transistor and to said second collector, said emitter terminal adapted to be coupled to ground and said collector terminal coupled to the input of said output stage; and

a capacitor having a first terminal coupled to said first collector and a second terminal coupled to the collector of said gain transistor.

4,393,356

FILTER CIRCUIT FOR ELECTRIC WAVES

Friedrich L. Kuenemund, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

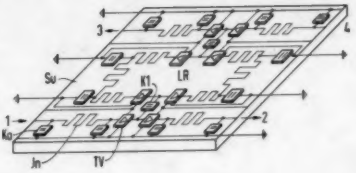
Continuation of Ser. No. 630,932, Nov. 11, 1975, abandoned. This application May 21, 1980, Ser. No. 151,772

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1974, 2453669

Int. Cl.³ H03H *11/04, 17/00*

U.S. Cl. 333—165 **6 Claims**

1. An electrical filter comprising, input and output lines having pairs of input and output terminals, a first charge coupled device having a plurality of charge storage cells each of a first charge storage capacity with its input connected to one input terminal of said input line and its output connected to the other input terminal of said input line, a pulse generator producing "n" phase related pulse trains at a certain frequency and supplying inputs to said charge storage cells of said first charge coupled device to move charges therethrough, a second charge coupled device having a plurality of charge storage cells each of said first charge storage capacity with its input connected to one output terminal of said output line and its output connected to the other output terminal of said output line, a pulse generator producing "n" phase related pulse trains at a certain frequency and supplying inputs to said cells of said second charge coupled device to move charges therethrough, a first non-directional coupling element coupled to an intermediate storage cell of said first charge coupled device, a second non-directional coupling element coupled to an intermediate storage cell of said second charge coupled device, a third



charge coupled device having a plurality of charge storage cells of different or the same storage capacity as the storage cells of said first and second charge coupled devices with its output connected to its input, a pulse generator producing "n" phase related pulse trains at a certain frequency and supplying inputs to said cells of said third charge coupled device to move charges therethrough, one of the storage cells of said third charge coupled device coupled to said first non-directional coupling element and another of the storage cells of said third charge coupled device coupled to said second non-directional coupling element.

4,393,357

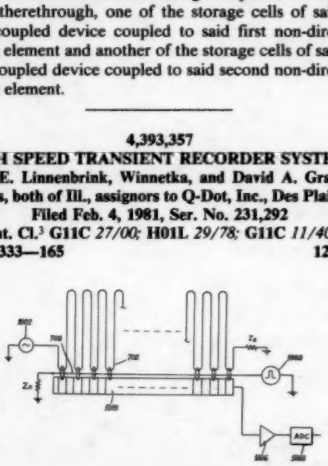
HIGH SPEED TRANSIENT RECORDER SYSTEMS

Thomas E. Linnenbrink, Winnetka, and David A. Gradl, Des Plaines, both of Ill., assignors to Q-Dot, Inc., Des Plaines, Ill.

Filed Feb. 4, 1981, Ser. No. 231,292

Int. Cl.³ G11C *27/00;* **H01L** *29/78;* **G11C** *11/40*

U.S. Cl. 333—165 **12 Claims**



1. An integrated circuit device for recording transient data signals comprising,

charge transfer channel means for providing a plurality of charge potential wells at a plurality of sampling sites disposed along a charge transfer channel, and for transferring charge carrier packets along said channel,

an electrical transient data signal transmission line means disposed at least in part along said transfer channel means at said sampling sites, for receiving an electrical transient data signal to be recorded and for propagating said electrical transient data signal successively to each of said plurality of sampling sites such that said electrical transient data signal propagated thereon is distributed along said transmission line means to apply the electric field of said transient data signal distributed thereon to charge carriers at each respective sampling site, and

means for transferring and isolating charge carriers at a

selected sampling time when a transient data signal to be recorded is distributed along said transmission line at each of said charge potential wells in response to the transient data signal potential provided by said transmission line means at each of said respective sampling sites to thereby provide charge packets of charge carriers disposed along said charge transfer channel which record said electrical transient data signal.

4,393,358

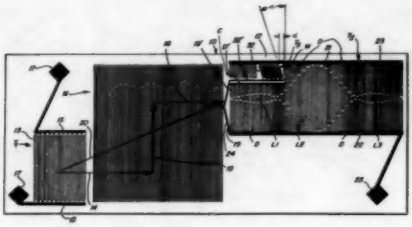
SURFACE WAVE ACOUSTIC DEVICE WITH COMPENSATION FOR DIFFRACTION EFFECTS

Adrian J. De Vries, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 18, 1981, Ser. No. 322,331

Int. Cl.³ H03H *9/145, 9/64, 9/42*

U.S. Cl. 333—194 **12 Claims**



1. A surface wave acoustic device adapted to be employed in an environment where it receives a surface acoustic signal including a desired frequency component having wave fronts substantially parallel to a selected direction and an undesired frequency component having wave fronts at a substantial angle to said selected direction, said device comprising:

a primary array and a secondary array of finger pairs, each of said pairs having respective lengths interdigitated with each other whereby to function as respective elemental electro-acoustic transducers;

said interdigitated lengths of said finger pairs of said primary array being oriented substantially parallel to said selected direction, and those of said secondary array being oriented substantially parallel to said wave fronts of said undesired frequency component;

and an electrical circuit including means electrically connecting said primary and secondary arrays so that their instantaneous outputs add phasorially;

said secondary array being positioned relative to said primary array so as to be substantially in electrical phase opposition thereto whereby the response of said secondary array to said undesired frequency component tends to compensate for the response of said primary array thereto.

4,393,359

ELECTROMAGNETIC RELAY

Gary W. Schreiner, Sterling; Merle L. Kemp, Jr., Prophetstown, both of Ill., and Edward A. Chernoff, Brookville, N.Y., assignors to Products Unlimited Corp., Sterling, Ill.

Filed Nov. 12, 1981, Ser. No. 320,323

Int. Cl.³ H01H *51/08*

U.S. Cl. 335—128 **5 Claims**

1. An electromagnetic relay comprising in combination,

an insulating base member,

an electromagnetic coil mounted on said base member,

an armature means pivotally mounted to said base member with one end portion movable between upper and lower positions in response to the energization and denergization of said coil,

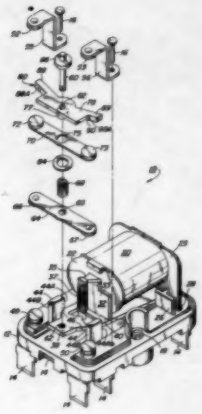
spring means biasing said armature into one of said positions,

a contact carrier post affixed to said one end portion of said armature and extending upwardly therefrom,

first and second contacts mounted to said base on opposite sides of said armature,

a lower contact carrier blade slidably mounted on said post and carrying a pair of contacts adapted to respectively engage said first and second contacts when said armature is in said lower position.

first and second upstanding abutment guide means integral with said base member and respectively disposed on opposite sides of said armature for limiting lateral movement thereof and for limiting rotational movement of said lower contact carrier blade,



first and second contact carrier brackets mounted to said base and respectively carrying third and fourth contacts in spaced, vertical alignment with said first and second contacts,

an upper contact carrier blade slidably mounted on said post and carrying a pair of upper contacts adapted to respectively engage said third and fourth contacts when said armature is in said upper position, and

a compression spring compressed between said upper and lower contact carrier blades to urge said blades in mutually spaced apart relationship.

4,393,360

ELECTRICAL SWITCH STRUCTURE

Kaneyasu Arakawa, and Shigeo Mizuno, both of Nagoya, Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed May 27, 1981, Ser. No. 268,092

Claims priority, application Japan, May 27, 1980, 55-72003[U]

Int. Cl.³ H01H *9/20*

U.S. Cl. 335—164 **5 Claims**

1. An electrical switch comprising:

a lever rotatably mounted in a case for movement between a neutral position and an actuated position,

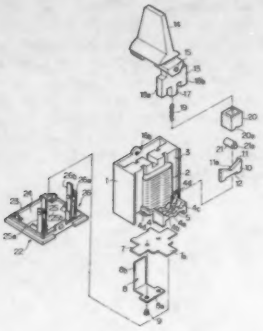
a switch member positioned in said case comprising a pair of normally open contacts,

means on said lever to close said contacts when said lever moves to said actuated position,

latch means to hold said lever in said actuated position comprising a first, central detent portion and at least one other detent portion juxtaposed to said first portion,

spring biased roller means carried by said lever to engage said first detent portion when the lever is in said neutral position and to engage said other detent portion when in said actuated position, and

solenoid means to move said latch means to return said lever from said actuated position to said neutral position when



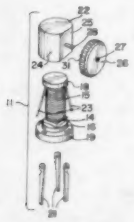
required to return said contacts to said normally open condition.

4,393,361

VARIABLE MAGNETICALLY BIASED LINEARITY CONTROL

Stanley K. Horton, McHenry, Ill., assignor to Prem Magnetics, Inc., McHenry, Ill.

Filed Sep. 23, 1981, Ser. No. 304,817
Int. Cl.³ H01F *1/00*
U.S. Cl. 335—212 **5 Claims**



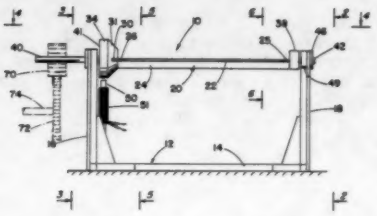
1. A variable magnetically biased linearity coil assembly for use such as with a cathode ray tube display device, comprising, in combination, an essentially I-shaped core, a coil wound on said core, a first permanent magnet stationarily mounted adjacent one end of said I-shaped core, a second permanent magnet mounted adjacent the opposite end of said core, said first and second magnets providing a magnetic field having flux lines extending through said core, a non-magnetizable support mounted adjacent said one end of said core, a cylindrically shaped element having a magnetized substantially flat surface thereon mounted on said support in spaced relation to said core and said magnets with said magnetized flat surface facing said core and said magnet, a mounting shaft extending outwardly from said support in a direction transverse to the axis of said I-shaped core for mounting said element in rotatable relation to said core and said magnets, and rotatable adjustment of said element selectively adjusting the magnetic strength of said second magnet to thereby provide an adjustable linearity coil.

4,393,362

ELECTROMAGNETIC INDICATOR HAVING A ROTOR DISPOSABLE IN DISCRETE POSITIONS

Alfred Skrobisch, Commack, N.Y., assignor to The Staver Company, Inc., Bay Shore, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,309
Int. Cl.³ H01F *7/08, 7/14*
U.S. Cl. 335—272 **10 Claims**



1. An indicator device having two stable positions comprising:

a stator having a stationary elongated reversable polarity permanent magnet core;

means for reversing polarity of said permanent magnet core;

a rotor carried by said stator and having a magnet disposed adjacent to said core, said rotor being turnable angularly on an axis perpendicular to said elongated core from one of said stable positions to the second of said stable positions upon reversing polarity of said permanent magnet core;

said magnet having two magnetic poles each of which is located on the same side of a diameter of said rotor which diameter passes through said elongated core at each of said stable positions so that reversing polarity of said core will produce reverse turning movements of said magnet; and

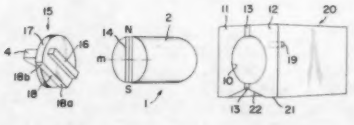
stop means carried by said stator and rotor and arranged for selective engagement so that rotation of said rotor is stopped at one of said stable positions in its angular movement where both of said poles are spaced from said core with one of said poles closest to said core attracted magnetically to said core while said stop means prevent rotation and vibratory movements of said rotor.

4,393,363

MAGNET BASE FOR TOOL

Hiroshi Iwasaki, Tokyo, Japan, assignor to Fuju Jiko Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,442
Int. Cl.³ H01F *7/20*
U.S. Cl. 335—288 **6 Claims**



1. A magnet base for a tool comprising: a cylindrical ferrite magnet having N and S poles respectively on both sides of a plane including the central axis of said magnet; a yoke having a cylindrical hole in which said magnet is rotatably fitted, said yoke being made up of two parts which are respectively positioned on opposite sides of a plane in parallel with the central axis of said hole, said two parts being joined together with a non-magnetic-permeable metal material; and a handle unit engaged with said magnet, said handle unit having a handle on

the outside thereof to turn said magnet, which magnet base comprises:

said cylindrical ferrite magnet having a sectional area substantially filling said cylindrical hole formed by said yoke;

said two parts of said yoke being fabricated from a magnetic metal material;

a stopper protruded from the inner surface of said cylindrical hole;

a cut formed in the peripheral portion of said handle unit in such a manner that said cut is engaged with said stopper as said handle unit turns;

said magnet base being placed in "off" state when said cut is engaged with said stopper by turning said handle unit in one direction, and said magnet base being placed in "on" state by turning said handle unit in the opposite direction to engage said cut with said stopper; wherein

said stopper is so positioned that, when said cut is engaged with said stopper by turning said handle unit in said opposite direction, attraction takes place between said yoke and said magnet to push said cut against said stopper.

4,393,364

COIL ELEMENT

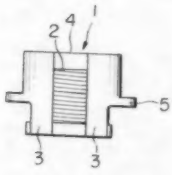
Takayuki Suda, Kisakata, and Koichi Yasuda, Nishime, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,456

Claims priority, application Japan, Sep. 19, 1980, 55-132248[U]

Int. Cl.³ H01F *15/02, 15/10*

U.S. Cl. 336—65 **4 Claims**



1. A coil element comprising a drum-shaped ferrite core on which a coil is wound, magnetic members each made of a magnetic and electrically conductive metal and formed so as to fit to the outer surface of said drum-shaped ferrite core and spaced from each other so as to be electrically insulated from each other, and connection terminals forming a part of said magnetic members connected to the ends of said coil.

4,393,365

METHOD AND SYSTEM FOR FORECASTING AND WARNING ON AUTOMOTIVE ABNORMALITIES

Nobuo Kondo, Anjo; Masanori Naganoma; Hitoshi Hibi, both of Kariya; Tetsuo Fujii, Toyohashi, and Kunihiko Suzuki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 2, 1981, Ser. No. 279,710

Claims priority, application Japan, Jul. 7, 1980, 55-92924

Int. Cl.³ B60Q *5/00*

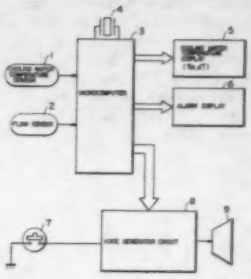
U.S. Cl. 340—57 **10 Claims**

1. An automotive abnormality forecasting and warning method comprising the steps of:

detecting the condition of an inspection item of the automobile and generating a detection signal according to said condition;

generating an alarm display and a voice alarm on said abnormal item in response to a decision that said detection signal has exceeded a predetermined value;

calculating the change rate of said detection signal when said detection signal is smaller than the predetermined value; and



forecasting an abnormality and displaying an alarm on the basis of the trend of deterioration of the inspection item by the use of said change rate and said detection signal.

4,393,366

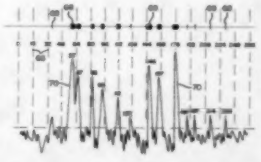
ROTATING BEAM OCULAR IDENTIFICATION APPARATUS AND METHOD

Robert B. Hill, Portland, Oreg., assignor to Eye-D Development II Ltd., Portland, Oreg.

Filed Feb. 17, 1981, Ser. No. 235,150

Int. Cl.³ G06K *9/00*; A61B *3/10*

U.S. Cl. 382—2 **26 Claims**



1. Apparatus for recording an identification pattern from the fundus of an eye, comprising:

(a) a light source operable to produce a substantially columnar source beam of light;

(b) beam directing means for directing at least a portion of the source beam into the eye from a plurality of sequential angularly divergent positions, the light substantially focusing on the fundus of the eye and being reflected in part out of the eye forming a reflected beam;

(c) detector means for sequentially sensing the amount of light in the reflected beam at each angularly divergent position of the source beam; and

(d) means for recording the amounts of light thus sensed to form an identification pattern.

4,393,367

DIGITAL COMPANDOR HAVING NONLINEAR COMPANDING CHARACTERISTICS

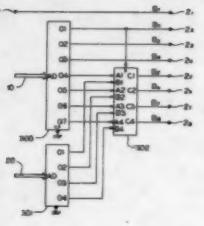
Rikio Maruta, and Atsushi Tomozawa, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 934,985, Aug. 18, 1978. This application Aug. 24, 1979, Ser. No. 69,384

Claims priority, application Japan, Aug. 22, 1977, 52-100927

Int. Cl.³ H04L *3/00*

U.S. Cl. 340—347 DD **2 Claims**



1. A digital compandor for converting linear code signal into a nonlinear code signal, said linear code having a polarity bit which is representative of the polarity of each sample value of the original analog signal and a plurality of absolute value bits which are representative of the absolute value of the sample, said nonlinear code having said polarity bit, a plurality of segment bits which identify one of a predetermined number of segments to which said sample value of the original signal belongs and mantissa bits which are indicative of the position of said sample value in said segment, said compandor comprising: a plurality of input terminal means for receiving said linear code signal; a first read-only memory means addressable by a first bit group including a predetermined plurality of bits among said absolute value bits for memorizing a first segment bit decision rule and a first mantissa bit decision rule by which said plurality of segment bits and said plurality of mantissa bits are respectively determined responsive to said first bit group; a second read-only memory means addressable by a second bit group including another plurality of bits among said absolute bits and having some bits in common with said first bit group for memorizing a second segment bit decision rule and a second mantissa bit decision rule by which said plurality of segment bits and said plurality of mantissa bits are respectively determined responsive to said second bit group; and means for selecting said first or second read-only memory means responsive to selected bits of said first bit group.

4,393,368

MULTITHRESHOLD A/D CONVERTER UTILIZING ERROR AMPLIFIERS

Erling E. Rasmussen, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 16, 1980, Ser. No. 150,502

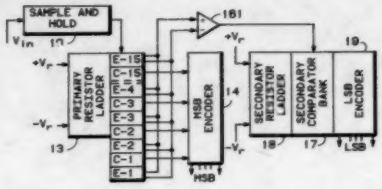
Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **20 Claims**

1. A multithreshold A/D converter comprising:

a plurality of primary comparison means each for comparing a selected threshold reference voltage level with a given analog input signal level; and

a plurality of error amplifiers each of said error amplifiers coupled to a threshold reference voltage level intermediate those threshold reference levels utilized by adjacent pairs of said plurality of comparison means, a selected one of said error amplifiers outputting a signal differential of



said intermediate threshold reference voltage level and said given analog input signal level.

4,393,369

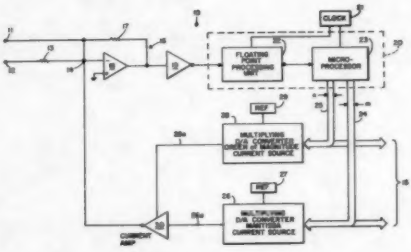
FLOATING-POINT A/D AND D/A CONVERTER

Kirk E. Davies, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 16, 1981, Ser. No. 243,985

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **2 Claims**



1. An apparatus for producing digital signals indicative of a floating decimal point representation of widely ranging input analog signals in a delta modulation servo loop comprising:

a serially connected resistor coupled to receive the input analog signals for assuring that the input analog signal is an input analog current signal;

an operational amplifier having a resistive feedback loop to produce a positive voltage and negative voltage coupled to the serially connected resistor for comparing the analog current signal with a derived reference signal to produce the negative voltage if the analog current signal exceeds the derived reference siangl and the positive voltage if the analog current signal is less than the derived reference signal, the derived reference current is subtracted from the input signal current therefore resulting in small currents and voltages for the system to operate on;

an inverter circuit coupled to the operational amplifier for generating a logic signal representative of a positive voltage and a logic signal representative of a negative voltage;

an interconnected floating point processing unit and microprocessor coupled to the inverter circuit for providing a first group of digital signals indicative of the mantissa and a second group of digital signals indicative of the order of magnitude;

a first high speed multiplying digital-to-analog converter coupled to a reference potential source and coupled to the providing means for converting the first group of mantissa digital signals to a mantissa component of the derived reference signal;

a second high speed multiplying digital-to-analog converter

coupled to a reference potential source and coupled to the interconnected floating point processing unit and microprocessor for converting the second group of order of magnitude digital signals to an order of magnitude component of the derived reference signal;

means coupled to the first and second high speed multiplying digital-to-analog converters for multiplying the mantissa component and the order of magnitude component into the derived reference signal and for feeding the derived reference signal and input analog current signal to the comparing means;

means coupled to receive the first and second groups of digital signals for passing them to user components;

means for feeding in a current signal to the operational amplifier when the widely ranging input analog signals are current signals; and

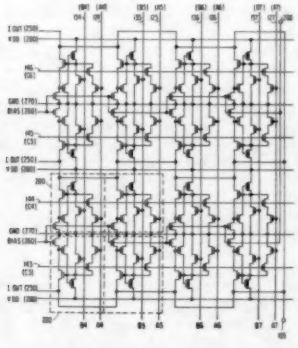
means for amplifying and inverting the derived reference current coupled between the outputs of the first and second high speed multiplying digital-to-analog converters and operational amplifier.

4,393,370

DIGITAL TO ANALOG CONVERTER USING MATRIX OF CURRENT SOURCES

Kyuichi Hareyama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1981, Ser. No. 258,711
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **13 Claims**



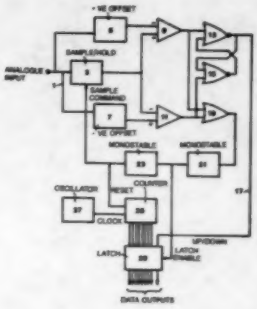
1. A semiconductor circuit comprising an output terminal; a plurality of current switch cells arrayed in a plurality of rows and columns, each of said cells including a current terminal, a current source and switch means coupled between the current terminal and current source and generating a current at the current terminal when selected; means for connecting the current terminals of said cells to said output terminal in common; means for receiving a plurality of digital signals; first means responsive to a first part of said digital signals for selecting a number of rows in accordance with said first part of said digital, and second means responsive to a second part of said digital signals for selecting the columns, whereby a number of cells corresponding to the value of said digital signals are simultaneously selected and currents from the selected cells are derived at said output terminal.

4,393,371

ANALOGUE TO DIGITAL SIGNAL CONVERSION AND STORAGE SYSTEM

Peter J. Morgan-Smith, Hatfield, England, assignor to Morgan-Smith Electronics Ltd., Hatfield Herts., England

Continuation of Ser. No. 45,604, Jun. 5, 1979, abandoned. This application May 18, 1981, Ser. No. 264,232
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **11 Claims**



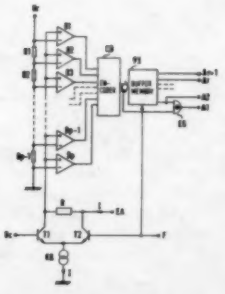
1. An analogue-to-digital signal conversion and storage system including means for sampling the analogue signal at successive time intervals and producing at each sample a digital signal, the interval between successive samples being dependent upon the rate of change of amplitude of the analogue signal during said time interval, timing means for determining the time interval between successive samples, storage means including a data buffer to which data from the system is supplied and from which data is applied to a recording means, the speed at which data is stored in the recording means being variable, and means for producing a control signal for adjusting said speed in response to the amount of data stored in the buffer, said signal being arranged to prevent overload of the buffer.

4,393,372

PARALLEL ANALOG-TO-DIGITAL CONVERTER

Wolfgang Hoehn, Kirchzarten, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,295
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **2 Claims**



1. In a parallel analog-to-digital converter with $p=2^r-1$ comparators, where r is the number of bits of the $(r+1)$-bit converter output signal diminished by 1, and the analog signal is applied to either the noninverting or inverting input of each

comparator and the other of said comparator inputs being connected consecutively to the taps of a resistive voltage divider consisting of equal-value resistors and having a reference voltage (Ur) applied thereto, wherein the analog signal is shifted by $\Delta U = Ur/2^{r+1}$ for the duration of every second clock period of the converter clock signal, and wherein the comparator outputs are connected to a digital encoder followed by a buffer memory, wherein the improvement comprises:

a pair of transistors having their emitters connected;

a resistor connected between the collectors of the two transistors, with the analog signal being applied to the appropriate comparator inputs through said resistor;

a constant current source disposed in the emitter path of the pair of transistors, the base of one of the transistors being supplied with a fixed potential, and the base of the other transistor being fed with a clock signal having one-half the frequency of the converter clock signal, the value of the resistor being chosen in accordance with the equation $R = \Delta U/I = 2^{-(r+1)}\ Ur/I$, where I is the strength of the constant current source; and

an exclusive-OR gate having inputs being provided with the least significant bit at the output of the digital encoder and the corresponding bit at the output of the buffer memory, whereby the gate output provides a signal that functions as the least significant bit of the output signal of the parallel analog-to-digital converter.

4,393,373

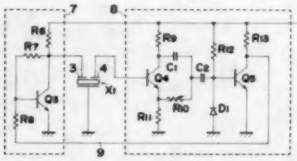
PIEZOELECTRIC AUDIBLE SOUND GENERATOR

Michihiro Torii, Hamamatsu; Kohei Hirukawa, Kosai; Hiroshi Urata, Aichi, and Shinichi Suzuki, Hamamatsu, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 243,743

Int. Cl.³ G08B 3/00; H01L 41/04

U.S. Cl. 340—384 E **5 Claims**



1. A piezoelectric audible sound generator comprising:

a self oscillator including a piezoelectric transducer which includes inherent equivalent capacitance between first and second electrodes thereof, amplifier means connected to said first and second electrodes for driving said piezoelectric transducer to oscillate at a predetermined frequency and in a predetermined phase, said amplifier means including inherent bias resistance therein which when combined with said inherent capacitance, produces a phase shift between the driving frequency of said amplifier and the frequency of oscillation of said transducer, and a feedback circuit for transferring a feedback signal from a third electrode of said piezoelectric transducer to said amplifier means, and

phase compensator means interposed between said third electrode and said feedback circuit for adjusting the phase shift such that said feedback signal from said third electrode is 170°–190° out of phase relative to a signal from said driving electrode.

4,393,374

LOW POWER SIREN

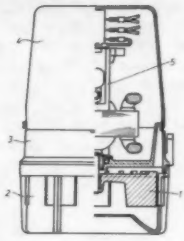
Bojan Bandelj, Skofja Loka, Yugoslavia, assignor to ISKRA-SOZD elektrokovinske industrije n.sol.o., Ljubljana, Yugoslavia

Filed Mar. 23, 1981, Ser. No. 246,842

Claims priority, application Yugoslavia, Mar. 24, 1980, 816/80

Int. Cl.³ G08B 3/00; G10K 7/04

U.S. Cl. 340—405 **5 Claims**



1. A low power siren comprising:

a first casing;

a motor disposed in said first casing and having an output shaft protruding from said first casing;

a second casing having an inlet end defining a nozzle for admitting air into the interior thereof, said walls, and openings formed in the side walls for egress of air from the interior of said second casing;

means for interconnecting said first and said second casings; and

a rotor disposed in said second casing, said rotor having a hub connected to said shaft, a plurality of air cutters having circumferentially extending portions extending around the periphery of said rotor, and ribs merging with said air cutters for directly connecting central portions of the circumferentially extending portions of the air cutters with said hub whereby air drawn into said second casing through said nozzle by rotation of said rotor passes said air cutters generating noise and exits said second casing through said side wall openings, said air cutters and said ribs being positioned on one surface of said rotor and a plurality of low ribs extending outwardly from an opposed surface of said rotor, said low ribs being equally circumferentially spaced around the periphery of said rotor and contributing to the noise generated by rotation of said rotor.

4,393,375

CONTROL SYSTEM FOR COPYING APPARATUS

Masamichi Sugiura, Toyokawa, and Kenji Shibazaki, Aichi, both of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Nov. 6, 1980, Ser. No. 204,592

Claims priority, application Japan, Nov. 15, 1979, 54-148633

Int. Cl.³ G06F 9/06; G03B 27/34

U.S. Cl. 340—700 **16 Claims**

1. In a reproduction machine for producing paper copies of original documents having the capacity of providing discrete operating features such as providing one or more copies, varying the magnification of a copy, changing the size of the copy paper and changing the image density, the improvement including a control system comprising:

an information display member;

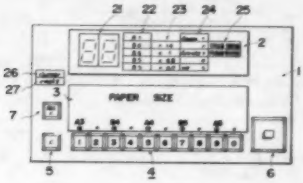
means for sequentially displaying an identification of discrete operating features of the reproduction machine on the same display member;

memory means for storing a predetermined set of first command signals for each discrete operating feature;

operator controlled input means for selectively generating second input command signals relative to specific operating features;

means for coordinating a particular operating feature that is identified on the display member with a specific second input command signal;

means for storing the specific second input command signals, and



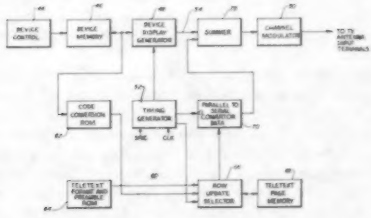
means for altering the predetermined set of first command signals by replacing any individual predetermined first command signal with a corresponding operator generated second input command signal to subsequently cause the reproduction machine to be activated in response to the predetermined set of first command signals as altered by the operator generated second input command signals.

4,393,376

TELETEXT INTERFACE FOR DIGITAL STORAGE MEDIUM HAVING SYNTHETIC VIDEO GENERATOR

William L. Thomas, Northbrook, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 4, 1981, Ser. No. 270,293
Int. Cl.³ G09G 1//16
U.S. Cl. 340—717 **12 Claims**



1. An interface circuit for use with a television receiver and means storing a plurality of digitally encoded signals each representing a selected text/graphics character intended for transmission as a corresponding video signal during the active scanning lines of a standard television signal comprising:

means converting each of said digitally encoded signals to a teletext encoded signal representing a corresponding text/graphics character;

means arranging said teletext encoded signals in a plurality of standard teletext formatted data rows;

means inserting in time multiplexed manner each of said teletext formatted data rows in a respective teletext line of said television signal;

means amplitude modulating said television signal including said video signal and said teletext lines on a television channel RF carrier; and

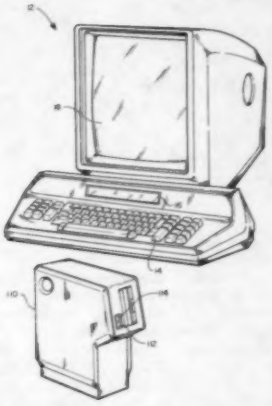
means for coupling said modulated television signal to the antenna terminals of said television receiver, whereby a television receiver having a built-in teletext type decoder is operable in response to said teletext formatted data rows for displaying said selected text/graphics characters in a relatively high quality form and a standard television receiver is operable in response to the video signal comprising said active scanning lines for displaying said text/graphics characters in a poorer quality form.

4,393,377

CIRCUIT FOR CONTROLLING INFORMATION ON A DISPLAY

Robert A. Couper, Sunnyvale; John K. Frediani, Santa Cruz, and Terrance L. Lillie, Palo Alto, all of Calif., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 12, 1980, Ser. No. 177,322
Int. Cl.³ G06F 3/153
U.S. Cl. 340—731 **14 Claims**



1. A circuit for controlling the display of characters on a display, said characters being selected from a preselected set of characters in response to character signal information, comprising:

(a) a character latch for latching character information, said character latch energized by said character signal information;

(b) a row counter energized by line synchronization signal information;

(c) means comprising a first and a second character generator which stores an output of visual representational information regarding the characters in said set, said first and said second character generator coupled to said character latch and said row counter, so that said character information and the row count define the output of said generators;

(d) width generator means for storage and output of width information regarding the width of the characters in said set coupled to said character latch so that said character information defines the width output;

(e) a first parallel input/serial output shift register and a second parallel input/serial output shift register for generating first and second serial outputs respectively, said first shift register input coupled to said first character generator output and said second shift register input coupled to said second character generator output;

(f) synchronizer means coupled to said first and said second shift registers for generating synchronized video-output signals corresponding to the bit by bit interleaving of said serial output signals for applications to said display, whereby a predetermined visual representation corresponding to a horizontal segment of the characters defined by said character information is displayed on a line of said display;

(g) a width counter means, coupled to be energized by said width generator means, for generating an output signal indicating that the character width has been scanned, said output signal from said counter means coupled to said character latch and said synchronizer means to initiate latching

of new character signal information and display of the next character.

4,393,378

GENERATION OF A LIGHT INTENSITY CONTROL SIGNAL

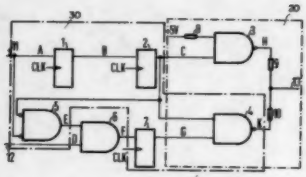
Petter Danielsen, Schwerte, Fed. Rep. of Germany, and Tor Moen, Oslo, Norway, assignors to Tandberg Data A/S, Norway

Filed Apr. 13, 1981, Ser. No. 253,372

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036737

Int. Cl.³ G06F 3/14

U.S. Cl. 340—744 6 Claims



1. A system for generation of a light intensity control signal for a video amplifier of a data display device connected with a video signal on a video signal line and a pulse generator by which characters are displayed by use of horizontal bright lines, vertical rows of bright points, and also blanks, comprising: a converter means connected with the video amplifier for providing a light intensity control signal with differentiatable analog output values to the video amplifier; a detector device means connected with the video signal line and the converter means for identification of a signal sequence associated with a line, a point or a blank; and said detector device means including first delay means for delaying the video signal by two clock pulse periods of clock pulses of said pulse generator, and comparator means for providing to the converter means a signal increasing the light intensity only upon recognition of a portion of the video signal which corresponds to a bright point arranged between two directly adjacent blanks.

4,393,379

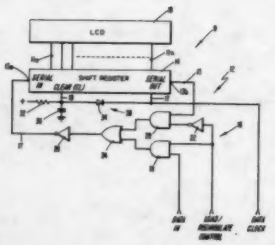
NON-MULTIPLEXED LCD DRIVE CIRCUIT

John P. Berting, 13 Fleetwood Rd., Newark, N.J. 07106, and James K. Kroeger, 319 Radel Ter., South Orange, N.J. 07079

Filed Dec. 31, 1980, Ser. No. 243,973

Int. Cl.³ G09G 3/36

U.S. Cl. 340—784 7 Claims



1. A liquid crystal display (LCD) drive circuit using recirculating shift register means for generating bit parallel output data to be applied to an LCD for display as a stationary image by repetitively recirculating a number of bits corresponding to a number of stages of said register means and, upon completion of each recirculation of bits, transferring the contents of said register means to said LCD, the drive circuit comprising display update means for loading display data into said shift register means, display refresh means including data inversion means for recirculating data stored in said shift register means, switch means for selectively operating said update and refresh means, clock means for shifting data stored in said shift register means and means synchronized to the clock means for transferring the bit parallel data from said shift register to be displayed as a stationary image on said LCD.

4,393,380

LIQUID CRYSTAL DISPLAY SYSTEMS

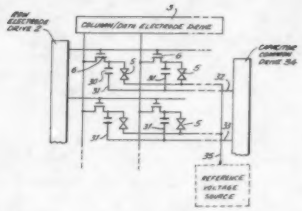
Minoru Hosokawa; Masayuki Ikeda, and Satoru Yazawa, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Sōkosha, Tokyo, Japan

Filed May 28, 1980, Ser. No. 153,973

Claims priority, application Japan, May 28, 1979, 54-65914; May 28, 1979, 54-65915

Int. Cl.³ G09G 3/36

U.S. Cl. 340—805 18 Claims



1. A liquid crystal display circuit comprising:

a plurality of liquid crystal picture elements, said picture elements being arranged in a fixed pattern, each picture element having a picture element electrode and an opposed common electrode, the common electrodes of all said picture elements being connected to a common potential;

means for selecting picture elements for display of an image signal, each said picture element electrode being connected to said means for selecting;

a plurality of capacitors, one capacitor associated with each said picture element, one terminal of each said capacitor being coupled to the picture element electrode of the associated picture element, the other terminal of said capacitor being coupled to one of a plurality of common capacitor electrodes, a plurality of said capacitors being connected to every common capacitor electrode;

voltage means, said voltage means being adapted to output a plurality of voltage levels, said voltage levels changing periodically, said common capacitor electrodes and said commonly connected capacitor terminals being connected periodically to the output of said voltage means, said changing voltage levels at said common capacitor electrodes providing an AC voltage on said picture element electrodes relative to said common picture electrodes at said common potential.

4,393,381

TRANSFER BUS MATRIX

Lewis J. Seiden, Tappan, N.Y., assignor to T-Bar Incorporated, Wilton, Conn.

Filed Jan. 2, 1981, Ser. No. 222,064

Int. Cl.³ H04J 6/00; H04Q 9/00

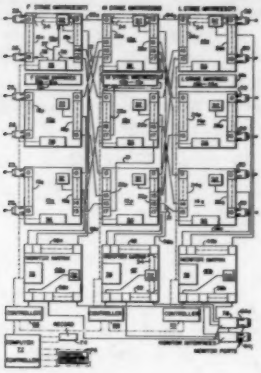
U.S. Cl. 340—825.83 20 Claims

1. A transfer bus matrix switching system for connecting selected input ports to selected output ports whereby multiple signals may be sequentially carried by the bus comprising:

a bidirectional transmission line transfer bus providing a common parallel multi-line channel for all signals;

a plurality of input bidirectional channels connected to the bus by individual gate means providing input ports;

a plurality of output bidirectional channels connected to the bus by individual gate means providing output ports; and



control means independent of the bus and input and output ports for selectively activating an input port and at least one output port contemporaneously and sequentially connecting such selected ports via the transfer bus.

4,393,382

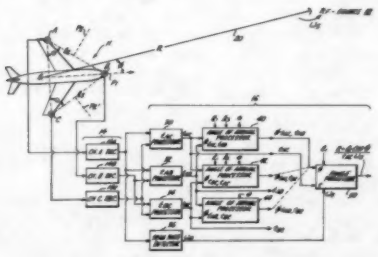
DIRECTION FINDING AND RANGING SYSTEM FOR LOCATING SCANNING EMITTERS

William R. Jones, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 25, 1980, Ser. No. 144,166

Int. Cl.³ G01S *11/00, 3/48*

U.S. Cl. 343—112 D **17 Claims**



1. An apparatus for passively locating a distant scanning source of radiant energy transmission, comprising:

first, second and third receiving devices arranged in a spatial array that forms a triangle in which said devices are located at the apexes of said triangle having a side designated AB between said first and second receiving devices, a side AC between said first and third receiving devices and a side BC between said second and third receiving devices, wherein the lengths of said sides are l_{AB}, l_{AC}, l_{BC}, respectively and the interior angles at the apexes are α associated with said first device, β associated with said second device and γ associated with said third device, each of said devices being responsive to the receipt of said radiant energy transmission to produce an electrical signal representative thereof such that when said array is oriented generally coplanar with a scan sweep of said transmission, the resulting electrical signals from at least two differently constituted pairs of said devices have a measurable time differential;

time differential signal processing means coupled to said devices for producing at least first and second time differential signals representing said measurable time differentials associated with said two differently constituted pairs of devices; and

at least a first angle of arrival processor means having inputs coupled to receive said first and second time differential signals and having an output, said first angle of arrival processor means producing at said output a first signal representing a first angular direction at which said transmission arrives at said array measured as the following function of said first and second time differential signals which are respectively represented by t_{AB} and t_{BC}:

$$\phi_1 (or\ t_{AB}, t_{BC}) = \tan^{-1} \frac{l_{AB}\, t_{BC} \csc \beta}{t_{AB}\, l_{BC}} - \operatorname{ctn} \beta$$

wherein ϕ_1 is an angle referenced to the side of said triangle designated AB and represents said first angular direction.

4,393,383

MOBILE ANTENNA MOUNTING ASSEMBLY

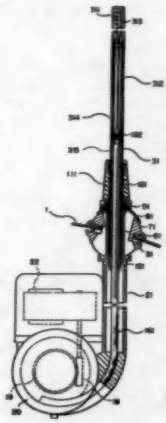
Koji Yamashita, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1980, Ser. No. 206,062

Claims priority, application Japan, Nov. 16, 1979, 54/159760[U]; Nov. 16, 1979, 54/159761[U]

Int. Cl.³ H01Q *1/32, 1/10*

U.S. Cl. 343—903 **5 Claims**



1. A mobile antenna mount comprising a telescoping antenna means, upper and lower hemispherical bushing means having at least a bottom portion for positioning above and below a body panel for supporting said antenna, a bore extending through said bushing means with sufficient angular clearance to enable an adjustment of said antenna position on said panel, flexible coupling means between said antenna and said bushing means to enable a deflection of said antenna responsive to a mechanical force acting upon said antenna, flexible co-axial cable means free of contact pressure directly extending from the bottom of said telescoping antenna means for conveying signals between said antenna and equipment associated therewith, and an elongated encasing means extending downwardly from said lower hemispherical bushing for receiving said telescoping antenna when in a retracted position, said coaxial cable being movable within said encasing means to enable said an-

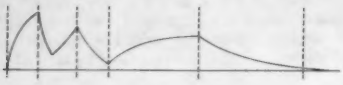
tenna to telescope between an extended and a retracted position.

4,393,384

INK PRINTHEAD DROPLET EJECTING TECHNIQUE

Edmond L. Kyser, Portola Valley, Calif., assignor to System Industries Inc., Milpitas, Calif.

Filed Jun. 5, 1981, Ser. No. 271,015
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—1.1 **2 Claims**



1. A method of ejecting a controlled droplet of ink from the nozzle of an ink jet printhead, wherein the nozzle is connected to an enclosed chamber, comprising the steps of:

suddenly reducing the volume in said chamber to accelerate the ink in said nozzle to the desired velocity;

suddenly increasing the volume in said chamber;

immediately reducing the volume in said chamber an amount less than in said first volume reduction step in a manner to maintain said ink at the desired velocity; and

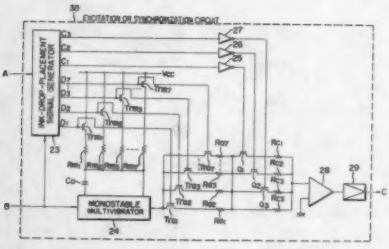
increasing the volume in said chamber to eject a droplet of ink, whereby the volume of ink in said droplet is a function of the duration of said second volume reduction step.

4,393,385

CONTROLLABLE INK DROP VELOCITY TYPE INK-JET PRINTER

Koichiro Jinnai, Kawasaki; Masanori Horike, Yokohama; Kyuhachiro Iwasaki, Fujisawa, and Yutaka Kodama, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 48,170, Jun. 13, 1979, Pat. No. 4,313,123. This application Aug. 27, 1981, Ser. No. 296,630
Claims priority, application Japan, Jun. 21, 1978, 53-74172
The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **1 Claim**



1. A deflection type ink-jet printer, comprising:

an ink drop generator for ejecting a stream of ink drops;

means for supplying ink to said generator;

velocity modulation means mounted on said generator for varying the velocity of ink-drops ejected from said generator in accordance with the pulse width—pulse amplitude product of a pulsed excitation signal;

means for charging the ink drops ejected from said generator;

means for deflecting the ink drops charged by said charging means, the amount of deflection being dependent upon the velocity with which said ink drops are ejected from said generator, the amount of deflection therefore being dependent upon the pulse width—pulse amplitude product of said pulsed excitation signal; and

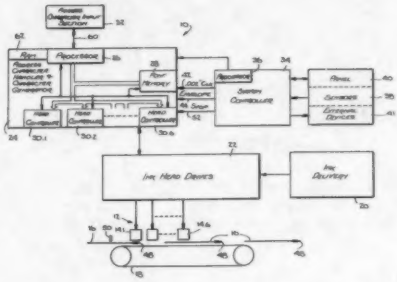
signal generating means for generating said pulsed excitation signal and for varying the pulse width—pulse amplitude product of said signal, and thus the ink drop velocity, in accordance with the desired ink drop print pattern and with the presence or absence of an immediately preceding ink drop.

4,393,386

INK JET PRINTING APPARATUS

Peter C. Di Giulio, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 30, 1981, Ser. No. 307,339
Int. Cl.³ G01D *15/18, 5/26*
U.S. Cl. 346—75 **10 Claims**



1. A computer controlled ink jet apparatus for printing a sequence of sheets with relative movement in a first direction between an ink jet apparatus and the sheets comprising:

an array of ink jet heads disposed to each eject ink drops onto the relatively moving sheets, said ink jet heads each having a plurality of ink ejecting orifices and being positioned along said first direction and displaced laterally relative to one another and to said first direction to print different lines of images on the sheets;

means for generating image signals representative of the ink drops to be ejected by the ink jet heads for the formation of lines of images on the sheets during relative motion between the sheets and the ink jet heads;

storage means for storing image signals for respective ones of said ink jet heads in the array;

means for generating sheet signals, each representative of the arrival of a sheet at a location having a known distance from the ink jet heads in the array; and

means responsive to the sheet signals for applying said stored image signals to respective ink jet heads for their actuation in a predetermined timed relationship selected to print lines of images on each sheet from the array of ink jet heads at desired sheet locations.

4,393,387

BEAM RECORDING APPARATUS EFFECTING THE RECORDING BY A PLURALITY OF BEAMS

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

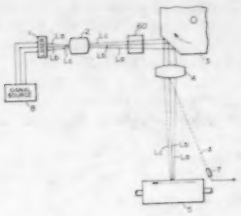
Filed Sep. 4, 1980, Ser. No. 184,146
Claims priority, application Japan, Sep. 14, 1979, 54-118246; Jan. 10, 1980, 55-1571; Jan. 24, 1980, 55-7224; Jan. 24, 1980, 55-7231; Jun. 19, 1980, 55-83064; Jun. 24, 1980, 55-85574
Int. Cl.³ G01D *15/4*
U.S. Cl. 346—108 **6 Claims**

1. Beam recording apparatus for recording with a plurality of beams, said apparatus comprising:

beam generating means for generating a plurality of beams modulated with recording signals;

beam deflecting means for deflecting the beams generated by said beam generating means;

beam irradiated means irradiated with the plurality of beams deflected by said beam deflecting means; and



optical means for directing the beams generated by said beam generating means to said beam irradiated means; and

rotating means for rotating said optical means and said beam generating means as a single unit to vary the inclination of the beams with respect to said beam irradiated means.

4,393,388

LIQUID DROPLET PROJECTION APPARATUS

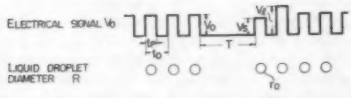
Yasumasa Matsuda, Hitachi; Kyoji Mukumoto, Katsuta; Syoji Sagae, Hitachiota, and Masatoshi Kasahara, Hitachi, all of Japan, assignors to Hitachi Koki Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,185

Claims priority, application Japan, Mar. 10, 1980, 55-29177

Int. Cl.³ G03B *15/18*

U.S. Cl. 346—140 R **3 Claims**



1. A liquid droplet projection apparatus comprising a liquid droplet ejection nozzle, a liquid supply tank, an electro-mechanical transducer section, interposed between said liquid supply tank and said liquid droplet ejection nozzle, for changing its volume in accordance with an electrical signal applied thereto to cause liquid droplets to be ejected from said liquid droplet ejection nozzle, and liquid droplet diameter corrector means in which when the pattern of said electrical signal applied to said electro-mechanical transducer section has an interruption period longer than a predetermined duration and at least three successive electrical signals are generated following said interruption period, said correction means changes at least selected one of the amplitude and width of the second one of said successive electrical signals to produce a corrected electrical signal which is larger in the selected one of the amplitude and width as compared with the corresponding one of the amplitude and width of the others of said electrical signals.

4,393,389

MAGNETIC TONER TRANSFER METHOD AND APPARATUS

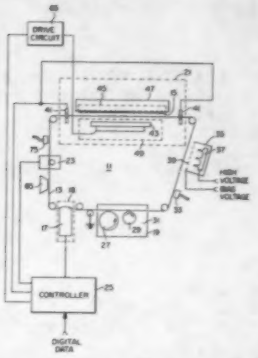
Houshang Rasekhi, Convent Station, N.J., and Alfred M. Nelson, Redondo Beach, Calif., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jan. 26, 1981, Ser. No. 228,526

Int. Cl.³ G01D *15/06*; **G03G** *15/16*

U.S. Cl. 346—153.1 **17 Claims**

10. A relatively high speed magnetic printing apparatus providing letter quality transfer of toner particles predeterminably arranged to correspond to a latent magnetic image on a surface of a magnetic medium to a receiving medium, the combination comprising means for establishing at least a first pretransfer force of attraction (f_1) including electrostatic and magnetic field forces between the toner and the magnetic medium and drive means for effecting relatively high speed,



generally perpendicular relative approaching and separating, variable movement between the magnetic and receiving mediums according to the relationship that the maximum force (f_2) exerted on the toner particles by air currents created by such movement is less than the force (f_1) for any instantaneous separation between the magnetic and receiving mediums.

4,393,390

ELECTROSTATIC PRINTER

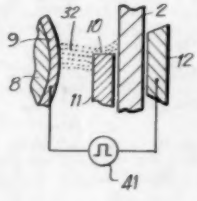
Kenji Aoki; Mitsuhiro Goto, and Teiji Miura, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Nagano, Japan

Filed Sep. 24, 1980, Ser. No. 190,149

Claims priority, application Japan, Sep. 28, 1979, 54-126085; Sep. 28, 1979, 54-126086; Sep. 28, 1979, 54-126088

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—155 **35 Claims**



1. An electrostatic printer for printing on an electrostatic recording medium comprising an elongated electrode and a back electrode spaced from said elongated electrode to define a gap therebetween and adapted to permit the passage of said electrostatic recording medium in said gap in a predetermined direction, a gap-reducing member disposed in said gap and extending essentially transverse to the predetermined direction of passage of said recording medium, said gap-reducing member being spaced from said back electrode to permit the passage of said recording medium therebetween, said recording medium and said gap-reducing member being out of contact with said elongated electrode, said gap-reducing member effectively reducing said gap at a point on said elongated electrode, means for displacing said elongated electrode relative to said back electrode so that said point on said elongated elec-

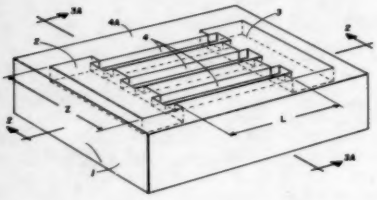
trode then defining said effectively reduced gap is displaced laterally of said direction of passage of said electrostatic recording medium in response to the displacement of said elongated electrode, and means for selectively applying a voltage between said elongated electrode and said back electrode for effecting printing on said electrostatic recording medium in registration with the point on said elongated electrode then defining said effectively reduced gap.

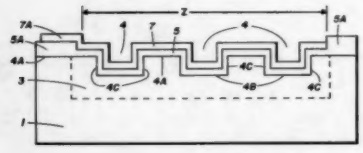
4,393,391

POWER MOS TRANSISTOR WITH A PLURALITY OF LONGITUDINAL GROOVES TO INCREASE CHANNEL CONDUCTING AREA

Richard A. Blanchard, Los Altos Hills, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Filed Jun. 16, 1980, Ser. No. 159,778
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23 **5 Claims**





1. A semiconductor device comprising in combination:
a substrate having a substantially plane first major surface;
first and second spaced regions of a first conductivity type formed in said surface;
a third region of a second conductivity type opposite said first conductivity type between said first and said second regions at said surface;
a plurality of spaced groove regions in said major surface, said groove regions being separated by portions of said substrate coplanar with said first major surface, and said grooves extending into each of said first, second, and third regions;
a thin insulating layer over said third region both in said grooves and across surface portions coplanar with said first major surface; and
gate means over said insulating layer for controlling a conductive surface channel between said first and second regions in said grooves and at said first major surface.

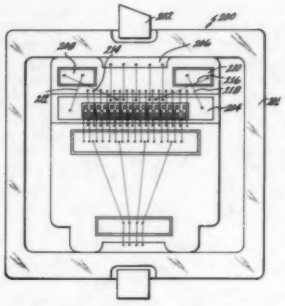
4,393,392

HYBRID TRANSISTOR

Raymond L. Hale, Torrance, Calif., assignor to Power Hybrids, Incorporated, Torrance, Calif.

Filed Jun. 23, 1980, Ser. No. 162,124
Int. Cl.³ H01L *23/02, 27/02, 23/48*
U.S. Cl. 357—74 **21 Claims**

7. A transistor package having an operating range of frequencies, including:
a body member;
a plurality of metallized elements disposed on the body member in spaced relationship to one another and defining terminals including an input terminal, an output pad and a reference area;
a transistor die disposed on the body member and defining a transistor and having at least one input electrode connected to the input terminal and at least one reference electrode connected to the reference area,
the transistor die and the metallized elements being constructed and disposed relative to one another on the body member to define an equivalent output circuit having a capacitive reactance;
first means disposed on the body member in contiguous but spaced relationship to the metallized elements to define a capacitance; and



second means including a plurality of wires disposed on the body member and connected electrically to the first means and the metallized element defining the output pad to define an inductance in series with the capacitance,
the first means and the second means being constructed to provide a resonance with the capacitive reactance in the equivalent output circuit at a particular frequency dependent upon the operating range of frequencies,
the wires in the plurality being connected at one end to the first means and at the other end to the metallized element defining the output pad, the different wires in the plurality being distributed along such metallized element at their connections to such metallized element and being disposed in transverse relationship to one another.

4,393,393

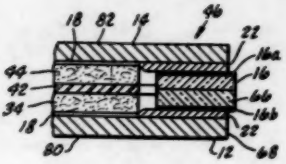
LASER DIODE WITH DOUBLE SIDED HEAT SINK

Louis B. Allen, Jr., Florissant; Herbert G. Koenig, Jr., St. Charles; Robert A. Stacy, Chesterfield, and Danny D. Meyer, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation of Ser. No. 65,918, Aug. 13, 1979, abandoned. This application May 8, 1981, Ser. No. 261,832
Int. Cl.³ H01L *23/02, 23/48, 29/44*
U.S. Cl. 357—81 **9 Claims**

1. A heat sink mounted laser diode including:
first and second flat mounting plates of a predetermined outer shape, each mounting plate having a solder pad of predetermined shape thereon, at least one of said mounting plates being relatively thin;
a laser diode soldered between said first and second mounting plates to said solder pads; and
a least one flexible, electrically insulating spacer having heat activated adhesive properties positioned between said mounting plates, a predetermined outer shape similar to said predetermined outer shape of said mounting plates and a cutout adjacent said solder pads so said solder pads are not appreciably covered by said spacer, said adhesive

retaining said spacer to said mounting plates, the thickness of said diode plus said solder connecting solder pads, and



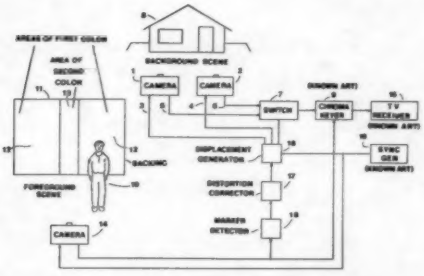
the thickness of said adhesive spacer being equal whereby there is relatively little mechanical strain applied to said diode.

4,393,394

TELEVISION IMAGE POSITIONING AND COMBINING SYSTEM

Reginald F.H. McCoy, 1354 NE. 31st Pl., Gainesville, Fla. 32601

Filed Aug. 17, 1981, Ser. No. 293,525
Int. Cl.³ H04N 9/535
U.S. Cl. 358—22 13 Claims



1. Apparatus for use with equipment producing a first television image, originating from a first television camera capable of being pointed in a variable direction so as to view differing parts of a foreground scene, said apparatus having the capability of producing a second television image formed by combination of parts of a pair of further images originating from a pair of further television cameras pointing in fixed directions so as to view different parts of a background scene, with horizontally displaced overlapping fields of view, said second television image moving coincident with, and corresponding to, horizontal motion of said first television image arising from change in the direction of viewing of said first television camera, in such manner that said first television image and said second television image may subsequently be combined, by the method of chroma-key, being known art, to form a combined image, said combined image then having the appearance of having been viewed by said first television camera, the position of objects portrayed in said combined image undergoing displacement in accordance with the horizontal motions of said first television camera, said displacement applying equally to that part of said combined image deriving from said first television camera capable of being pointed in a variable direction, and to that part of said combined image deriving from said second television image itself being derived from said further television cameras pointing in fixed directions, comprising:

a. means for sensing the direction of viewing of said first television camera, comprising a backing surface placed behind those parts of said foreground scene viewed by said first television camera, said backing surface having areas of a first color and an area of a second color different from said first color such as to cause said first television camera to generate two distinct and different values of its electrical output, the boundaries between said areas of said first color and said area of said second color being vertical lines, said boundaries performing the function of markers, the positions of said markers in the image formed by said first television camera being dependent on the direction of viewing of said first television camera,

b. marker detector means for detecting transitions between said distinct and different values of said electrical output generated by said first television camera when viewing said first color and said second color, thereby detecting said markers,

c. means for determining the positions within the image originating from said first television camera at which said transitions corresponding to said markers occur, and thereby producing indication of the direction of viewing of said first television camera,

d. displacement generator means for generating displacements of the positions of said pair of further images originating from said pair of further television cameras, consisting of means for accepting a first reference signal having synchronizing pulses in accordance with standard television practice; means for generating a second reference signal likewise having synchronizing pulses in accordance with standard television practice; and means for effecting a controllable variable time delay between the synchronizing pulses of said second reference signal and the synchronizing pulses of said first reference signal,

e. means for generating a pair of further reference signals also having synchronizing pulses in accordance with standard television practice,

f. means for effecting individually changeable time delays between the synchronizing pulses of said pair of further reference signals and the synchronizing pulses of said second reference signal,

g. means for supplying to each camera of said pair of further television cameras a timing signal, being a distinct one of said pair of further reference signals, in such manner that the timing of the synchronizing pulses of said timing signal controls the time at which said camera generates the electrical output signals corresponding to specific points in the scene viewed by said camera,

h. means for controlling said controllable variable time delay between the synchronizing pulses of said second reference signal and the synchronizing pulses of said first reference signal by an amount dependent on the direction of viewing of said first television camera derived from the detection of the positions of said markers in the output of said first television camera, said amount being such that the variation in said time delay so produced results in a variation in the timing of the video output signals derived from said pair of further television cameras equal to the variation in the timing of the occurrence of said markers in the video output signal of said first television camera; whereby a displacement in the timing of said markers resulting from a motion of said first television camera will cause an equal displacement in the timing of the video output signals from said pair of further television cameras,

i. means for setting said individually changeable time delays between the synchronizing pulses of said pair of further reference signals and the synchronizing pulses of said second reference signal such that the timings of each distinct one of said pair of further reference signals supplied to each one of said pair of further television cameras are such that, there being a first object viewed by the first one of said pair of further television cameras, being that camera placed to the left of the second one of said pair of further television cameras, said pair of further television cameras having horizontally overlapping fields of view, said first object being so positioned as to produce a video signal output from said first one of said pair of further television cameras at a time corresponding to the time of scanning of a part of the field of view close to the right

side of the limit of the field of view of said first one of said pair of further television cameras, said first object being viewed by said second one of said pair of further television cameras then producing a video signal output from said second one of said pair of further television cameras at a time coincident with the time of production of the corresponding video signal output due to said first object from the first one of said pair of further television cameras; and conversely a second object being viewed close to the left limit of the field of view of said second one of said pair of further television cameras producing a video signal output coincident in time with the video signal output produced said second object when viewed by said first one of said pair of further television cameras; whereby said pair of further television cameras may have overlapping fields of view and the timings of said timing signals controlling the scannings of each of said pair of further television cameras may be so set that objects simultaneously appearing in the fields of view of both of said pair of further television cameras will produce video signal outputs coincident in time,

j. means for generating a switch control signal so timed as to occur during the time of overlap of the fields of view of said pair of further television cameras such that said switch control signal will occur during the simultaneous presence of the video output signals from said first and second objects, both being viewed by both of said pair of further television cameras, in the video outputs of both of said pair of further television cameras, the timing of said switch control signal being directly related to the timings of said pair of further reference signals, said timings being set by way of said means for setting said individually changeable time delays such as to produce time coincidence of the video output signals from said pair of further television cameras deriving from objects within the overlapping fields of view of said pair of further television cameras, such as said first object and said second object, said switch control signal therefore being derivable from said pair of further reference signals by detection of the time of overlapping of the images of said pair of further television cameras; additionally means being provided to cause said switch control signal to be reset to its initial condition during the synchronizing pulses of said first reference signal; whereby the output of said first one of said pair of further television cameras will be selected following said synchronizing pulses of said first reference signal, being coincident with the start of scanning of a standard television display device on which the output of the system may be viewed, and

k. means for switching between the video signal outputs of said pair of further television cameras controlled by said switch control signal such that only one of said video signal outputs is selected at any one time, the selection being performed at those times at which the video signal outputs from a single object appearing in the fields of view of both of said pair of further television cameras are coincident in time; whereby a single continuous video output signal corresponding to a field of view part of which is derived from one, and the remainder from the other, of said pair of further television cameras, may be derived.

4,393,395

BALANCED MODULATOR WITH FEEDBACK STABILIZATION OF CARRIER BALANCE

Joseph F. Hacke, Blackwood, and Lucas J. Bazin, Vincentown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,226

Claims priority, application United Kingdom, Jan. 26, 1981, 8102283

Int. Cl.³ H04N *9/50*

U.S. Cl. 358—23 **11 Claims**

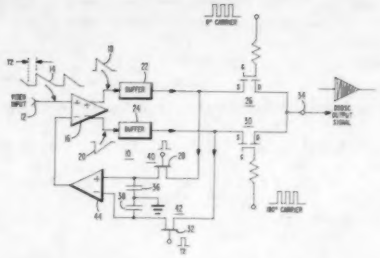
1. An improved suppressed-carrier balanced modulator for a video signal including a black-level interval comprising:

a phase splitter coupled to receive the video signal for producing first and second relatively inverse-phase output signals;

first and second modulator switches coupled to said phase splitter and to an output terminal of the modulator for alternately coupling said first and second inverse-phase output signals to said output terminal of said modulator at a carrier rate for creating a carrier suppressed by an amount dependent upon the equality of the amplitude of said first and second inverse-phase output signals, whereby inequality during the black level interval reduces said suppression;

wherein the improvement further comprises:

first and second sample-and-hold circuits, each coupled to said phase splitter for sampling one of said first and second



inverse-phase output signals for generating first and second sample signals, respectively, indicative of the value of said first and second inverse-phase signals, respectively, during said black interval;

differential amplifier means coupled to said first and second sample-and-hold circuits and responsive to the difference between said first and second sample signals for generating a control signal indicative of said difference; and

coupling means coupled to the output of said differential amplifier means and to said phase splitter for forming a degenerative feedback loop for reducing said difference between said first and second sample signals for improving the equality of the amplitudes of said first and second inverse-phase signals for improving the suppression of said modulator during black intervals.

4,393,396

VIDEO SIGNAL PROCESSING CIRCUIT FOR NOISE REDUCTION

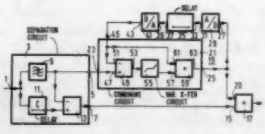
Johannes G. Raven, Eindhoven, and Marinus C. W. Van Buul, Breda, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 288,250

Claims priority, application Netherlands, Aug. 20, 1980, 8004696; Jan. 27, 1981, 8100361

Int. Cl.³ H04N *5/21, 9/535*

U.S. Cl. 358—36 **5 Claims**



1. A video signal processing circuit comprising a separation circuit having two outputs for providing separately a high-frequency and a low-frequency signal component from an input

video signal to be processed and a noise suppression circuit which operates on one of the separated video signal components received from said separation circuit, characterized in that the noise suppression circuit is coupled to the low-frequency signal component output of said separation circuit and comprises a comb filter having a delay circuit and a combining circuit, an output signal of said delay circuit being added to said low-frequency video signal component in said combining circuit.

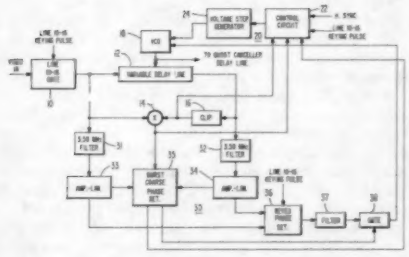
2. A video signal processing circuit as claimed in claim 1, characterized in that, for processing video signals containing color information for a color picture to be displayed as a result of the video signal, said video signal processing circuit further comprises means, coupled to the high-frequency signal component output of said separation circuit, for providing the color information contained in the high-frequency signal component of the video signal, and a further noise suppression circuit, having a variable transfer circuit therein, coupled to the output of said color information means, and said noise suppression circuit, coupled to the low-frequency signal component output of said separation circuit, further comprises a movement detector, an output of which is coupled to said variable transfer circuit in said further noise suppression circuit for controlling the transfer factor thereof.

4,393,397

TELEVISION GHOST SIGNAL DETECTOR WITH COLOR BURST PHASE DELAY CONTROL

David D. Holmes, Chesterfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,838
Int. Cl.³ H04N 5/21
U.S. Cl. 358—36 **9 Claims**



1. In a television receiver, including a source of video signals subject to contamination by ghost signals, said video signals including a signal interval suitable for use as a training signal interval, including a color burst signal component; a television ghost signal detector system comprising:

a variable delay line having a signal input and a signal output;

means, coupled to said variable delay line, for controlling the signal delay exhibited by said delay line between its input and its output;

means, coupled to said signal input of said variable delay line, for applying said video signals to said delay line input during said training signal interval; and

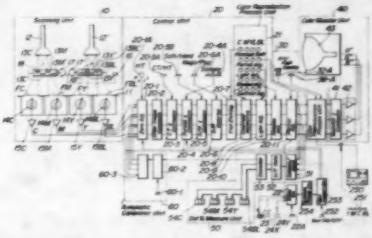
a tracking circuit having inputs coupled to the input and the output of said variable delay line, and an output coupled to said controlling means, and responsive to the appearance of a delayed burst signal component at the output of said delay line and to the appearance of a ghost of said burst signal component at the input of said delay line when a ghost signal is present, a phase detector means having inputs coupled to the input and output of said delay line for developing a control signal representative of the phase relationship of said delayed burst signal component at the output of said delay line and its ghost signal component at the input of said delay line, and means for applying said control signal to said controlling means for controlling said variable delay line in response to the phase relationship of said delayed burst signal component and its ghost signal component.

4,393,398

APPARATUS FOR SIMULATING COLOR PRINTING PROCESS

Satoru Horiguchi, Saitama; Takeshi Sasaoka, Kawasaki; Koichi Shimane, Kawasaki; Shigeru Mogi, Kawasaki; Tsuguo Yaguchi, Kawasaki, and Kazuhiko Sano, Kawasaki, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Ikegami Tsushinki Co., Ltd., both of Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,421
Claims priority, application Japan, May 20, 1980, 55-65933
Int. Cl.³ G03F 3/00; H04N 9/535
U.S. Cl. 358—76 **17 Claims**



1. An apparatus for simulating a color printing process wherein first, second, third and fourth color separation films formed from a color original are displayed as a color image, comprising:

a scanner unit including

a film setting stage for supporting said first, second, third and fourth color separation films in a side-by-side relation;

a first flying spot scanner tube for said first and second color separation films and a second flying spot scanner tube for said third and fourth color separation films;

a lens system for projecting a raster image of the screen of said first flying spot scanner tube onto said first and second color separation films and a raster image of the screen of said second flying spot scanner tube onto said third and fourth color separation films; and

a photomultiplier for each of said color separation films, each of said photomultipliers generating a signal corresponding to a subtractive primary color signal;

control means coupled to said scanning unit for gamma-correcting said subtractive primary color signals;

color reproduction process means coupled to said control means for converting said gamma-corrected subtractive primary color signals to additive primary color signals; and

a color monitor unit for receiving said displaying said additive primary color signals, said color monitor unit including

a color cathode ray tube having green, blue and red light-emitting phosphor elements for exhibiting a color reproduction characteristic wherein the coordinates of the green-emitting phosphor elements are approximately X=0.2, Y=0.67 on the chromaticity diagram, the red-emitting and blue-emitting phosphor elements cooperating with said green-emitting phosphor elements to substantially completely reproduce the printing colors; and

driving means for driving said color cathode ray tube at a resolution of between approximately 2.1 and 3 lines per millimeter.

4,393,399

METHOD AND APPARATUS FOR PARTIAL ELECTRONIC RETOUCHING OF COLORS

Uwe Gast, Rammsee; Eberhard Hennig, Ascheberg; Dieter Preuss; Heinz Taudt, both of Kiel, and Klaus Wellendorf, Heikendorf, all of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

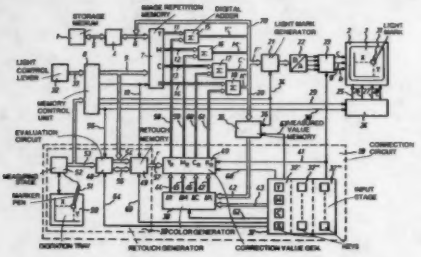
PCT No. PCT/DE80/00070, § 371 Date Jan. 18, 1981, § 102(e) Date Jan. 8, 1981, PCT Pub. No. WO80/02607, PCT Pub. Date Nov. 27, 1980

PCT Filed May 17, 1980, Ser. No. 229,584

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920058

Int. Cl.³ H04N 1/46

U.S. Cl. 358—80 31 Claims



1. The method for the partial electronic retouching of colors in color images, in which color signals obtained by point-by-point and trichromatic scanning of color originals are digitized and the digital color values of the individual color components are stored in a storage medium, and in which the stored color values are corrected by color correction values, so as to obtain retouched colors comprising the steps of:

(a) defining color increments values (ΔY, ΔM, ΔC, ΔK) for said individual color components, said color increment values respectively representing the smallest amount of correction for said color values (Y, M, C, K) per retouching step;

(b) selecting a positive or negative direction of retouching;

(c) identifying the pairs of locus-coordinates of the image points to be retouched in the color image by marking the locationally allocated points in a coordinate identification device (digitizer) with a marking means of said device, such as a coordinate pen cursor;

(d) during coordinate identification simultaneously determining the desired retouch strength for each image point to be retouched by generating a retouch factor (r) for each identified pair of locus-coordinates with said marking means, guiding said marking means similar to a retouch brush over that area of the coordinate identification device which corresponds to the area of the color image to be retouched, said retouch factor (r) representing a plurality of color increment values which are to be summed or to be subtracted at each image point which is to be retouched;

(e) generating correction values (Y_R, M_R, G_R, K_R) for each image point which is to be retouched by multiplying the retouch factor (r) with the individual color increment values;

and

(f) correcting said color values (Y, M, C, K) of the image points which are to be retouched by adding for positive retouching and subtracting for negative retouching said corresponding correction values (Y_R, M_R, C_R, K_R) of said image points in order to obtain corrected color values (Y', M', C', K') representing the retouched colors in said color image.

4,393,400

3-D TV SYSTEMS

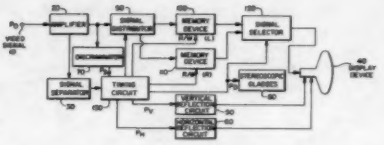
Hiroshi Ikushima, Hirakata; Takaaki Baba, Nishinomiya; Takayuki Sagishima, Suita, and Masanobu Tanaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 27, 1981, Ser. No. 267,520

Claims priority, application Japan, May 29, 1980, 55-72267

Int. Cl.³ H04N 9/58

U.S. Cl. 358—92 3 Claims



1. A 3-D TV viewing system comprising: a single image display device;

a set of vertical and horizontal deflection circuits for displaying an image on said display device;

a pair of spectacle devices corresponding to human eyes and comprising a light shutter that passes and shuts off light and is synchronized to an image displaying period in said display device;

a signal distributor for discriminating a left and a right image signal from a video signal consisting of two direction image signals;

a pair of memory devices corresponding to a left and a right image for writing into and reading out of a composite image signal transmitted from said distributor;

a signal-selector for selecting a left or a right image signal from a composite electrical image signal inputted from each of said pair of memory devices and for sending each image to said display device;

a synchronizing signal-separating circuit for separating an image pick-up signal which is synchronized to a vertical and a horizontal display signal;

a timing circuit having input terminals which are operatively connected to said synchronizing signal separator and (b) said discriminator, and having output terminals which are connected to (c) said vertical deflecting circuit, (d) said horizontal deflecting circuit, (e) said pair of spectacle devices, (f) said signal distributor, (g) one of said pair of memory devices used for a left image, (h) one of said pair of memory devices used for a right image, and (i) said signal selector said timing circuit generating, from a synchronizing separating signal and a discriminating signal P_D, (a) a vertical-synchronously separated signal P_V which is to be fed to said vertical deflecting circuit so as to multiply a sweeping frequency of said vertical deflecting circuit by m times an image pick-up frequency, wherein m is a positive integer which is greater than 1 (b) a horizontal-synchronously separated signal P_H which is to be fed to said horizontal deflecting circuit so as to multiply a sweeping frequency in said horizontal deflecting circuit by m times an image pick-up frequency, (c) a trigger signal P_D whose period is one m-th of an image pick-up period which is to be fed to said spectacles whereby human eyes are capable of fusing said left and right images in the time period which is twice a display period of said display device so as to obtain a stereoscopic view, (d) a composite signal P_s' which is to be fed to said signal distributor so as to respectively distribute each left and right image signal to each of said pair of memory devices, (e) trigger signals each having a period the same as that of said discriminating signal to be fed to said pair of memory devices which are capable of supplying each left and right image signal m times to said signal selector, and (f) a further trigger signal whose period is one m-th of said image pick-up period

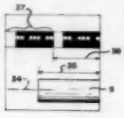
which is to be fed to said signal selector so as to repeatedly display the same single left or right image m times in said single display device.

4,393,401

METHOD AND APPARATUS FOR DIMENSIONALLY MEASURING ARTICLES

Donald L. Gorenflo, and William D. Noblit, III, both of Marion, Ohio, assignors to The Fairchild Engineering Company, Marion, Ohio

Filed Nov. 10, 1980, Ser. No. 205,319
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 **8 Claims**



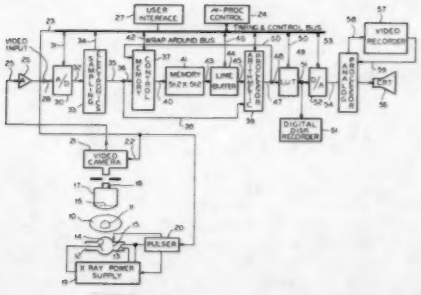
1. Apparatus for measuring a dimension of an article comprising a table for holding the article, a reference scale adjacent the table, a plurality of reference points on the scale, each reference point having a different code sequence to represent a different position on the scale, video camera means directed at each end of the distance to be measured and the reference scale, video digitizer means connected to the camera means and fixing the relative positions of one end of the distance to be measured from a reference point in digital form for each camera means, and computing means receiving the output of the digitizing means and computing therefrom the dimension of the article.

4,393,402

SUBTRACTION FLUOROSCOPY METHOD AND APPARATUS

Gary S. Keyes, Hartland; Jean-Pierre J. Georges, Waukesha, and Dennis G. DallaPiazza, Oconomowoc, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,314
Int. Cl.³ H04N 5/32
U.S. Cl. 358—111 **8 Claims**



1. A method of producing visible images by integrating difference images that are obtained by subtracting images acquired in pairs that result from exposing a subject to alternate low and high energy x-ray beams including the steps of:

projecting an x-ray beam having one energy and an x-ray beam having another energy through a subject in quick succession to produce a sequential pair of x-ray images,

converting the x-ray images in sequence to television frames comprised of lines of analog video signals,

converting said analog video signals to digital pixel signals each representing a picture element in an image frame,

storing the digital pixel signals for a frame at one energy in one digital memory and transferring the pixel signals out of said one memory in phase with corresponding digital pixel signals for the succeeding current frame at the other energy while simultaneously storing the pixel signals for the current frame in another memory and concurrently combining the pixel signals for the stored and current frames to yield difference digital pixel signals for a frame representative of the difference between the consecutive x-ray images,

next transferring the digital pixel signals for the frame at said other energy out of the second memory in phase with corresponding digital pixel signals for the current frame at the one energy while simultaneously storing the signals for the last-mentioned current frame at the one energy in the one memory and concurrently combining the pixel signals for the stored and current frames to yield difference digital pixel signals for a frame representative of the difference between the consecutive low and high energy x-ray images,

feeding the difference digital pixel signals for the first subtracted image in a series to be integrated to a third digital memory as the difference image signals are produced,

transferring the digital pixel signals out of said third memory for being combined with corresponding difference digital signals for the next frame and feeding back the combined signals to the locations in the third memory out of which corresponding difference digital pixel signals were transferred, and

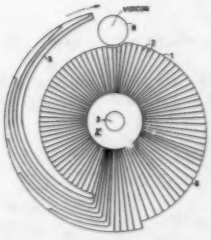
then converting the integrated digital pixel signals in the third memory to analog video signals for displaying the integrated difference image.

4,393,403

ROTATING DIAPHRAGM FOR A DYNAMIC PICK-UP DEVICE HAVING A PYROELECTRIC LAYER

Hans P. Geis, and Holger Helber, both of Bremen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1981, Ser. No. 267,215
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035240
Int. Cl.³ H04N 5/33
U.S. Cl. 358—113 **8 Claims**



1. A rotating diaphragm for a pickup device having a pyroelectric target, in operation said diaphragm rotating about an axis and periodically interrupting thermal radiation which is incident on the pyroelectric target, characterized in that said diaphragm comprises:

an electrically insulating material; and

a layer of electrically conductive material on the electrically insulating material, said electrically conductive layer being in the form of a pattern of electrically conductive

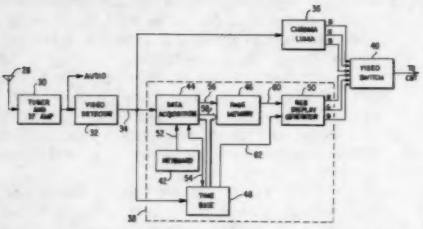
tracks in which substantially no eddy currents are generated on rotation of the diaphragm in a magnetic field.

4,393,404

SPECIAL SERVICES TELETEXT COMMUNICATIONS SYSTEM

Charles M. Cox, Buffalo Grove, and William L. Thomas, Northbrook, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 26, 1981, Ser. No. 238,510
Int. Cl.³ H04N 7/00, 7/08
U.S. Cl. 358—147 **6 Claims**



1. In a teletext communications system including a transmitter cyclically transmitting a plurality of teletext encoded data rows a selected number of which define a data page, the first data row of each data page comprising a page-header data row characterized by a page number address code for enabling acquisition of the remaining data rows of the respective data page by each of a plurality of standard teletext decoders, the improvement comprising:

means cooperating with said teletext transmitter for inserting at least one additional page-header formatted data row in said cyclical transmission, said additional page-header formatted data rows each including selected encoded data and a page number address code adapted for preventing acquisition thereof by said plurality of standard teletext decoders; and

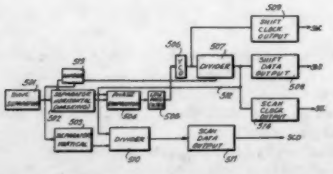
at least one data decoder comprising means adapted for receiving said cyclical transmission, means responsive to the page number address code of a received additional page-header formatted data row for acquiring only said additional page-header formatted data row and means comprising a single data row memory for storing the data encoded in said acquired additional page-header formatted data row.

4,393,405

SYNCHRONIZING CIRCUIT FOR MATRIX TELEVISION SET

Masayuki Ikeda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 295,192
Claims priority, application Japan, Aug. 22, 1980, 55-116278
Int. Cl.³ H04N 5/04, 5/08
U.S. Cl. 358—153 **13 Claims**



1. In a synchronizing circuit for a matrix television set having display means including picture elements arranged in a matrix of lines and columns, and connected to line driver and column driver circuits respectively so as to be individually selectable in both line and column directions, and wherein display is made by selecting lines and columns successively, the improvement therein comprising:

a voltage controlled oscillator circuit, said oscillator circuit producing a shift clock signal applied to said column driver circuits for selecting individual columns in succession;

first frequency divider means for dividing down an output frequency signal from said oscillator circuit, the output of said first frequency divider means being a clock signal applied to said line driver circuits for selecting individual lines in succession;

phase comparison means, said comparison means determining the difference in phase of a output of said first frequency divider means with the phase of a horizontal synchronizing signal, said horizontal synchronizing signal being a portion of a television signal transmission, an output of said comparison means being fed back to said oscillator circuit, said feedback being in proportion to said phase difference, said oscillator circuit being adapted to adjust the output frequency of oscillation in response to said phase difference signal, said adjustment causing said phase difference to approach zero, said clock signals being synchronized with said horizontal synchronizing signal;

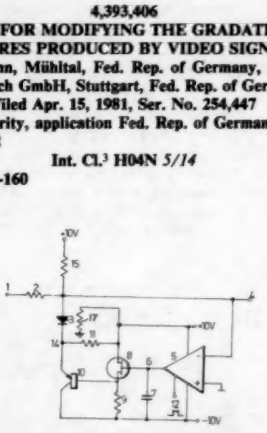
a second frequency divider means, said second frequency divider means further dividing the output signal from said first frequency divider, the output of said second frequency divider means being applied to said line driver circuits so as to provide vertical synchronization of picture frames in said television transmission.

4,393,406

CIRCUIT FOR MODIFYING THE GRADATION OF PICTURES PRODUCED BY VIDEO SIGNALS

Klaus Lehmann, Mühltal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,447
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016242
Int. Cl.³ H04N 5/14
U.S. Cl. 358—160 **3 Claims**



1. A circuit for modifying the gradation of pictures produced with video signals, comprising:

a first resistance (2) interposed between a source (1) of said video signals and an output terminal (4) for supplying video signals to picture producing apparatus;

an inverting keyable amplifier (5) having its input connected to said output terminal (4) and its keying input (12) connected so as to enable said amplifier only during blanking intervals of said video signals, said amplifier having a connection to a fixed reference potential and being constituted so as to provide a current at its output (6) of a polarity dependent on whether said potential of said output terminal (4) exceeds or is less than said reference potential;

a capacitor (7) connected to said output (6) of said amplifier

(5) for charging or discharging by output current of said amplifier (5) and for storing charge while said amplifier is disabled,

a diode (3) and an impedance converter (8,9,10,11) connected between said output terminal (4) and said output (6) of said amplifier in such a way that said diode is interposed between said output terminal (4) and said impedance converter and is poled so as to be conductive while the portion of said video signal between blanking intervals is provided by said video signal source (1), said impedance converter serving to cause the charging or discharging of said capacitor (7) to continue during video blanking intervals until the potential of said output terminal is substantially the same as said reference potential, and

means (15) for assuring that said diode remains conducting even when said output terminal is at said reference potential,

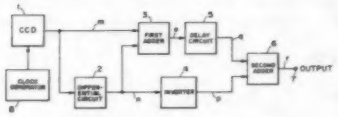
whereby substantially a voltage fraction of said video signals is made available at said output terminal (4) which fraction is determined by the ratio of the forward resistance of said diode to the sum of said diode forward resistance and said first resistance, while the temperature dependence of said diode forward resistance is compensated, at least for the black level of said video signal, during each blanking interval.

4,393,407

CONTOUR CORRECTING APPARATUS FOR VIDEO SIGNALS

Yoshikazu Yokomizo, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,445
Claims priority, application Japan, Nov. 7, 1979, 54-143972
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—166 **35 Claims**



1. A contour correcting apparatus for video signals, comprising:

differentiating means for differentiating an input video signal to produce a differentiated waveform;

delay means for delaying said differentiated waveform and said video signal for a predetermined time period to produce a delayed differentiated waveform and delayed video signal;

inverting means for phase inverting said differentiated waveform to produce a phase inverted differentiated waveform; and

combining means for combining said phase inverted differentiated waveform, said delayed differentiated waveform and said delayed video signal.

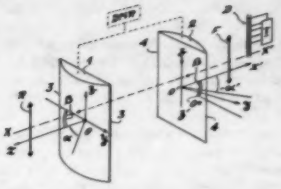
4,393,408

OPTOELECTRONIC DEVICE FOR ROTARY SCANNING OF VIDEOFREQUENCY IMAGES

Jean L. Beck; Jean F. le Bars; Yves A. Emmanuelli, and Denis Bargues, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1981, Ser. No. 311,382
Claims priority, application France, Oct. 17, 1980, 80 22275
Int. Cl.³ H04N *3/06, 3/14*
U.S. Cl. 358—205 **16 Claims**

1. An optoelectronic device for scanning videofrequency images comprising optical elements driven in rotation so as to produce an image scan, an optical element for focusing on a detection system comprising at least one array of detectors and videofrequency means for processing the signals delivered by the detectors, wherein the optical elements which are driven in rotation consist of an afocal system comprising at least two cylindrical optical elements driven together in rotation about



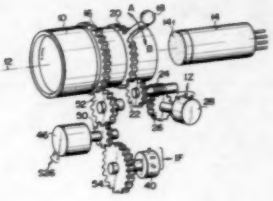
an axis which is perpendicular to the plane of their generatorlines and defines the optic axis of the device, and wherein the array of detectors comprises a plurality of detectors extending radially from said perpendicular axis, one of said detectors being centered on said axis.

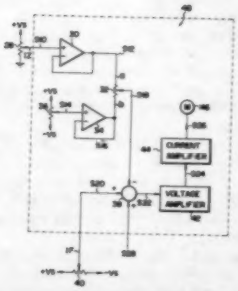
4,393,409

FOCUSING APPARATUS FOR IMAGE PICKUP DEVICE

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1981, Ser. No. 262,917
Claims priority, application Japan, May 30, 1980, 55-71476
Int. Cl.³ H04N *5/26*
U.S. Cl. 358—227 **12 Claims**





1. A focusing apparatus for an image pickup device comprising:

(a) an image pickup;

(b) focusing means for carrying out focus adjustment for said image pickup;

(c) zooming means coupled to said focusing means for carrying out zoom adjustment for said image pickup;

(d) first detection means coupled to said zooming means for supplying zoom data corresponding to the extent of zoom adjustment carried out by said zooming means;

(e) drive means for actuating said focusing means in accordance with said zoom data;

said focusing means, zooming means, first detection means and drive means jointly comprising a servo loop for carrying out a prescribed adjustment of the focus in accordance with the extent of zoom adjustment carried out by said zooming means; and

(f) second detection means coupled to said focusing means for providing focus data corresponding to the extent of focus adjustment carried out by said focusing means, said focus data being used as a control target of said servo loop;

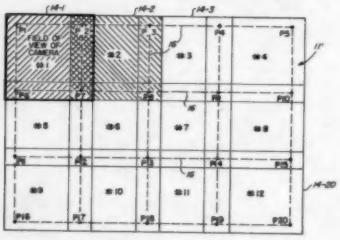
said second detection means including a screen which is connected to said focusing means and whose light transmittance varies with the extent of focus adjustment, and a photoelectric converter coupled to said screen for issuing focus data corresponding to the amount of light transmitted through said screen.

4,393,410

MULTIPLE CAMERA AUTOMATIC DIGITIZER AND METHOD

Warren J. Ridge, and Dennis C. Roberts, both of Scottsdale, Ariz., assignors to Wespac, San Diego, Calif.

Filed Nov. 13, 1981, Ser. No. 321,233
Int. Cl.³ H04N *1/10*
U.S. Cl. 358—285 **32 Claims**



1. A method of digitizing an item, said method comprising the steps of:

(a) operating a first video camera to effect producing camera coordinates of first and second alignment points in the field of view of said first video camera and to effect producing a first plurality of camera coordinates of a third alignment point, said third alignment point also being in the field of view of a second video camera;

(b) operating said second video camera to effect producing a second group of camera coordinates of said third alignment point, and to effect producing camera coordinates of a fourth alignment point in the field of view of said second video camera;

(c) computing skew corrected coordinates of said first alignment point from said camera coordinates of said first and second alignment points, said skew corrected coordinates of said first alignment point being referenced to a boundary of a skew corrected camera plane of said first video camera;

(d) computing a first plurality of skew corrected coordinates of said third alignment point from said camera coordinates of said third alignment point and said skew corrected coordinates of said first alignment point, said skew corrected coordinates of said third alignment point being referenced to said first alignment point;

(e) computing skew corrected, offset corrected coordinates of said third alignment point from both said skew corrected coordinates of said third alignment point and an offset number representing the distance of a boundary of a document plane to the boundary of said skew corrected camera plane of said first video camera, said skew corrected, offset corrected coordinates of said third alignment point being referenced to the boundary of said document plane;

(f) computing a second plurality of skew corrected coordinates of said third alignment point from said second group of camera coordinates of said third alignment point and said camera coordinates of said fourth alignment point, said second plurality of skew corrected coordinates of said third alignment point being referenced to a boundary of a skew coorected plane of said second video camera;

(g) operating said second video camera to effect producing of camera coordinates of a general point in the field of view of said second video camera, said general point being a point of the item to be digitized;

(h) computing skew corrected coordinates of said general point from said camera coordinates of said general point and said second plurality of skew corrected coordinates of said third alignment point, said skew corrected coordinates of said general point being referenced to said third alignment point;

(i) computing skew corrected, offset corrected coordinates of said general point from said skew corrected coordinates of said general point and said skew corrected, offset corrected coordinates of said third alignment point, said skew corrected, offset corrected coordinates of said general point being referenced to said boundary of said document plane;

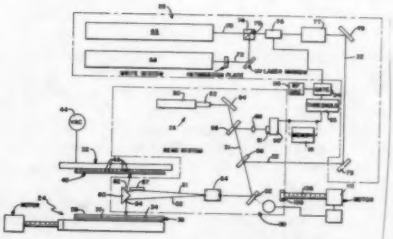
(j) outputting said skew corrected, offset corrected coordinates of said general point as a digitized value representing the location of said general point on said document.

4,393,411

LASER READ-WRITE SYSTEM FOR THE PRODUCTION OF ENGRAVINGS

Richard E. Amtower, Laguna Niguel, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 522,103, Nov. 8, 1974, abandoned. This application Jan. 10, 1977, Ser. No. 758,250
Int. Cl.³ H04N *1/42*
U.S. Cl. 358—302 **3 Claims**



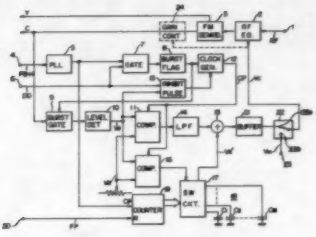
1. In a system for forming an image of an object on a writing surface: means for producing a reading beam and a writing beam for scanning of the object and the writing surface respectively, modulator means for varying the intensity of the writing beam, beam combiner means for directing the reading beam and the modulated writing beam generally together with a small divergence along a common path, beam separator means including a deflector positioned between the diverging beams with first and second surfaces for reflecting the respective beams toward the object and the writing surface, a reflector for reflecting one of the diverging beams back toward the other before the beams impinge upon the surfaces of the deflector, scanning means positioned along the common path for diverting the combined beams across a predetermined portion of the path to effect synchronous scanning of the object and the writing surface by the separated beams, and means responsive to energy received from the object as it is scanned by the reading beam for conditioning the modulator means to vary

the intensity of the writing beam to form an image of the object on the writing surface.

4,393,412
AUTOMATIC CHROMA LEVEL CONTROL CIRCUIT FOR COMPENSATING BOTH SLOW AND RAPID CHROMA LEVEL CHANGES

Mitsuhige Tatami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 23, 1980, Ser. No. 171,452
Claims priority, application Japan, Jul. 25, 1979, 54-94404
Int. Cl.³ H04N *9/49*
U.S. Cl. 358—318 **9 Claims**



1. An automatic chroma control circuit for compensating rapid and slow chroma level changes of chrominance signals reproduced from a video tape recorder, comprising:

means for deriving color burst signals which are representative of levels for said reproduced chrominance signals;

means connected to said color burst signal deriving means for detecting relatively rapid changes in the envelope level of the reproduced chrominance signals;

means connected to said color burst signal deriving means for detecting relatively slow changes in envelope level of the reproduced chrominance signals;

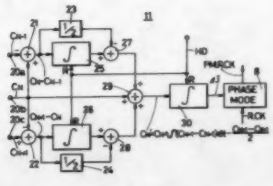
means for generating a chrominance level control signal by combining outputs of said means for detecting rapid level changes and means for detecting slow level changes of the reproduced chrominance signals; and

means for controlling amplitudes of said reproduced chrominance signals in response to said control signal derived from said chrominance level control signal generating means.

4,393,413
VELOCITY ERROR COMPENSATOR FOR TIME BASE ERROR CORRECTIONS OF PERIODIC INFORMATION SIGNALS

Shinji Kaneko, Sagamihara, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 243,855
Claims priority, application Japan, Mar. 18, 1980, 55-34615
Int. Cl.³ H04N *9/44, 9/46;* G11B *5/43;* H04N *5/78*
U.S. Cl. 358—326 **17 Claims**

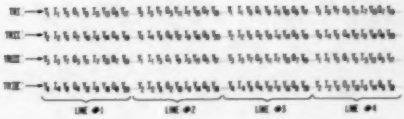


1. A velocity error compensator for use in a time base corrector of the type which corrects time base errors in periodic information signals having a main memory for storing plural periods of said information signals, write-in means for writing individual periods of said information signals into said main memory at a rate synchronized with said periodic information signals, and read-out means for reading out said individual periods of said information signals from said main memory at a reference read-out rate, said velocity error compensator comprising velocity error detecting means for detecting a velocity error in each period of said information signals and for producing a velocity error signal representative thereof; velocity error storage means for storing the velocity error signals associated with a plurality of said periods of information signals; velocity error read-out means for reading out from said velocity error storage means simultaneously the velocity error signal associated with the period of information signals then read out from said main memory and the velocity error signals associated with at lest the preceding and next-following periods of information signals read out from said main memory; combining means for combining the simultaneously read out velocity error signals to produce a velocity error-correction signal as a function of the simultaneously read out velocity error signals, said combining means including means for producing a gradient signal representing the gradient between the velocity error signals associated with said preceding and next-following periods of information signals, means for adjusting an offset in said gradient signal, means for summing the offset-adjusted gradient signal and said velocity error signal associated with the period of information signals then read out from said main memory and means for integrating the summed signals to produce said velocity rror-correction signal; and means for modulating said reference read-out rate in accordance with said velocity error-correction signal.

4,393,414
HORIZONTAL-RATE PHASE-CHANGE OF TV PIXEL DISTRIBUTION AMONG MULTIPLE RECORDER TRACKS FOR DROPOUT CONCEALMENT

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,925
Int. Cl.³ H04N *5/92*
U.S. Cl. 358—336 **7 Claims**



1. A television signal processing apparatus for processing signals for recording time-sampled television signals on a multitrack recording medium, said processing apparatus comprising:

controllable pixel distributing means coupled to the source of television signals and to the multitrack recording medium for distributing pixels among the tracks;

pixel-rate related control signal generating means coupled to said controllable pixel distributing means and to a source of pixel-rate clock signals associated with said source of video signals for generating pixel-rate control signals for controlling said controllable pixel distributing means for distributing time-segmented pixels received in time sequence cyclically to each track in turn whereby a dropout in a single track having a duration of less than one line allows estimation of the value of the dropped-out pixels but a dropout in a single track having a duration greater than one horizontal line drops out sufficient data so estimation from adjacent pixels is no longer possible; and

line-rate-related control signal generating means coupled to a source of line-rate signals associated with said source of television signals and with said controllable pixel distrib-

uting means for generating horizontal-line-rate control signals for controlling said controllable pixel distributing means for progressively changing the phase of said cyclical distribution of time-sequential pixels among said tracks at a rate which is the horizontal line rate divided by (N+1), where N represents the number of horizontal lines in the spatial pixel distribution of the raster which occur between identical line pixel patterns, whereby a dropout of one track for a time duration in excess of one horizontal line does not drop out spatially adjacent pixels whereby extimation of the value of the dropped-out pixels may be made from spatially adjacent pixels.

4,393,415

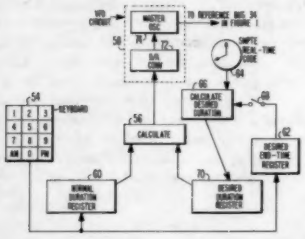
TIME CHANGING SYSTEM FOR VTR

Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1980, Ser. No. 201,436

Int. Cl.³ H04N *5/78*; G11B *15/46*

U.S. Cl. 360—9.1 **10 Claims**



1. A method for controlling the playback speed of a video tape recorder to conform to a selected speed different from a recording speed, said method comprising generating a signal having a frequency in accordance with said selected playback speed, applying said signal as a reference signal to a servo circuit, providing an output signal from said servo circuit for control of said playback speed to conform to said selected speed, whereby a reproduced video signal recorded in accordance with a frame rate no longer conforms to said frame rate, and converting the reproduced video signal to conform to a selected frame rate, said generating step comprising calculating the quotient of a normal playback time of a length of video tape to a desired playback time for said length, and controlling the frequency of an oscillator in accordance with said quotient.

4,393,416

TRACKING SYSTEM FOR A VIDEOTAPE RECORDER

Akihiro Takeuchi, Ikoma; Masaaki Kobayashi, Kawanishi, and Kiyoji Fujisawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 7, 1981, Ser. No. 281,043

Claims priority, application Japan, Jul. 9, 1980, 55-94424

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—10.2 **3 Claims**

1. A tracking system for a video recorder/reproducer employing a record medium having tracks for recording video signals and control signals which are representative of the record position of said video signals, said system comprising:

a transducing means for reproducing video signals recorded along said track on said record medium;

a positionable means with said transducing means mounted at a location thereon, said positionable means being movable at said location for displacing position of said transducing means;

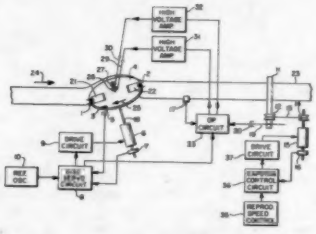
a control signal reproducing means for reproducing said control signals recorded along said track on said record medium;

a means for dividing interval of said control signals, said dividing means developing sub-control signals whose number is representative of the transported length of said record medium;

a rotation phase detector for detecting the rotating phase of said transducing means and for providing an output signal corresponding thereto;

an operational means for developing a displacement pattern signal which is representative of the location of said video track recorded on said record medium relative to said transducing means by using said control signals, said sub-control signals, and said output signal from said rotating phase detector; and

a means for supplying said displacement pattern signal to said positionable means, wherein said operational means comprises: (1) a still pattern generator for developing a still pattern signal whose value is zero at a beginning of scanning of said transducing means and whose value corresponds to one track pitch at an end of scanning of said



transducing means, (2) a counter unit for counting said sub-control signals and for generating bias signals and (3) an adder which adds the output signals of said still pattern generator and the output of said counter developing said displacing pattern signal; and wherein

said counter unit comprises: (1) a first counter which is reset by said control signals and counts said sub-control signals, (2) a second counter which is preset to a predetermined value m when an output signal of said first counter becomes larger than m and which counts said sub-control signals, and (3) a third counter comprising two separate counters, each of which is preset to an output signal of said second counter at a predetermined time and which counts said sub-control signals, outputs of said third counter comprising two separate counters being applied to said adder, whereby said transducing means is capable of tracking properly on said recorded video track at an arbitrary transporting speed of said record medium.

4,393,417

TRACKING SYSTEM

Masaaki Kobayashi, Kawanishi; Akihiro Takeuchi, Ikoma, and Kiyoji Fujisawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 156,194, Jun. 3, 1980, abandoned. This application Nov. 10, 1980, Ser. No. 205,599

Claims priority, application Japan, Jun. 4, 1979, 54-70313; Oct. 4, 1979, 54-128689; Apr. 22, 1980, 55-53260

Int. Cl.³ H04N *5/78*; G11B *21/10*

U.S. Cl. 360—10.3 **5 Claims**

1. A tracking system for video recorders/reproducers employing a record medium having tracks for recording video signals and for recording control signals which are representative of the record position of said video signals, said system comprising:

a transducing means for reproducing video signals recorded along said track on said record medium;

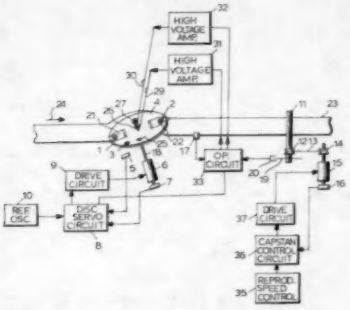
a positionable means having said transducing means mounted at a location thereon, said positionable means

being movable at said location for displacing the position of said transducing means;

a control signal reproducing means for reproducing said control signals recorded along at least one of said tracks on said record medium;

a means for dividing the interval of said control signals, said dividing means generating sub-control signals which are representative of the transported length of said record medium;

a rotating phase detector for detecting the rotating phase of said transducing means;



an operational means for generating a displacement pattern signal which is representative of the location of said video track recorded on said record medium with respect to said transducing means by using the output of said control signal reproducing means, said sub-control signals, and the output of said rotating phase detector; and

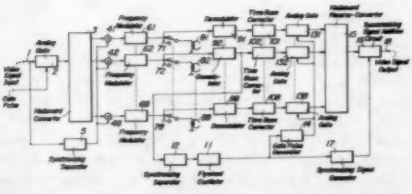
a means for supplying said displacement pattern signal to said positionable means, whereby said transducing means is capable of tracking properly on said recorded video track regardless of the transporting speed of said record medium.

4,393,418

TIME BASE ERROR CORRECTION SYSTEM

Kenji Kimura, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,352
Int. Cl.³ H04N *5/795*
U.S. Cl. 360—22 **2 Claims**



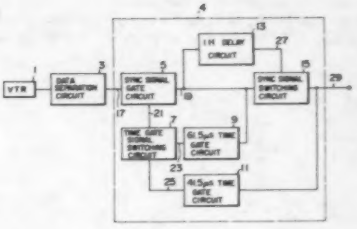
1. A device for recording and reproducing a video signal, comprising means for converting an incoming video signal into a plurality of signal channels, a plurality of magnetic heads for recording and reproducing said signal channels in association with a magnetic tape, first means for superimposing a pulse-like signal in the vicinity of the back porch of the incoming video signal, means for reconverting the plurality of signal channels to provide a reproduced video signal, second means for separating the superimposed pulse-like signal from the reproduced video signal, generator means for providing a horizontal synchronizing signal to be added to the reproduced video signal, third means for detecting relative phase fluctuation between the separated pulse-like signal and the horizontal synchronizing signal, and fourth means for controlling the phase of said horizontal synchronizing signal by the output of said third means and adding the horizontal synchronizing signal to said reproduced video signal.

4,393,419

SYNCHRONIZING SIGNAL DETECTION PROTECTIVE CIRCUIT

Takao Arai, Yokohama; Takashi Hoshino, Fujisawa, and Masaharu Kobayashi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,379
Claims priority, application Japan, Sep. 26, 1980, 55-132927
Int. Cl.³ H04N *5/04;* **G11B** *27/10*
U.S. Cl. 360—37.1 **5 Claims**



1. A synchronizing signal detection protective circuit for detecting a synchronizing signal on a recording medium with information to be recorded and the synchronizing signal being consecutively recorded thereon, comprising:

a first time gate circuit for generating a first time gate signal at a first predetermined time before an expected occurrence of said synchronizing signal;

a second time gate circuit for generating a second time gate signal at a second predetermined time before said expected occurrence of said synchronizing signal, said second predetermined time occurring before said first predetermined time;

a time gate signal switching circuit connected to said first and second time gate circuits and adapted to generate selectively one of said first time gate signal and second time gate signal;

a synchronizing signal gate circuit connected to said time gate signal switching circuit and adapted to control the gating time for detecting said synchronizing signal in response to one of said first and second time gate signals;

a compensatory synchronizing signal generating circuit for generating a compensatory synchronizing signal; and

a synchronizing signal switching circuit which conducts the synchronizing signal when said synchronizing signal has been detected by said synchronizing signal gate circuit in response to either one of said first and second time gate signals, and conducts said compensatory synchronizing signal when the synchronizing signal has not been detected by said synchronizing signal gate circuit in response to said first time gate signal.

4,393,420

TAPE RUN SPEED-CHANGING CIRCUIT

Yoshio Tomizawa, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 160,085
Claims priority, application Japan, Jun. 26, 1979, 54-80333
Int. Cl.³ G11B *15/44*
U.S. Cl. 360—73 **5 Claims**

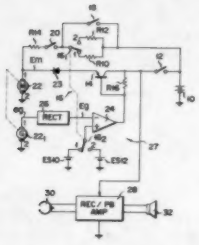
1. A tape run speed-changing circuit for a tape recorder

having recording, playback, cue and review modes of operation, which comprises:

a motor selectively driveable at a speed conforming to any of at least fist and second different tape run speeds for the recording or playback mode of the tape recorder and also selectively driveable at a respective different cue or review tape run speed matching each of said at least first and second tape run speeds of said recording or playback mode during operation in said cue or review mode of the tape recorder, said first and second tape run speeds of said recording or playback mode and said respective different cue or review tape run speeds being all different from each other, said cue or review tape run speeds being higher than said recording or playback tape run speeds, said first and second tape run speeds bearing respective ratios with the cue or review tape run speeds which respectively correspond to said first and second tape run speeds;

a first settable tape run speed-changing means coupled to said motor for setting any of said different tape run speed for said cue or review mode; and

a second settable tape run speed-changing means coupled to said motor and to said first tape run speed changing means



for setting either of said first and second tape run speeds for said recording or playback mode different from said tape run speeds for said cue and review modes, and for setting the tape run speed for said recording or playback mode interlockingly with the operation of said first tape run speed-changing means such that said first tape run speed-changing means is responsive to settings of said first second tape run speed-changing means; and

means coupled to said first and second tape run speed-changing means for controlling said motor such that when said second tape run speed-changing means sets said first tape run speed for said recording or playback mode, then said first tape run speed-changing means sets a first tape run speed for said cue or review mode different from said first tape run speed of said recording or playback mode; and when said second tape run speed-changing means sets said second tape run speed for said recording or playback mode, then said first tape run speed-changing means sets a second tape run speed for said cue or review mode different from said first and second tape run speeds of said recording or playback mode and also different from said first tape run speed of said cue or review mode.

4,393,421

RAPID STEPPING OF A MOVING RECORDED MEDIUM

George S. Zorbalas, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

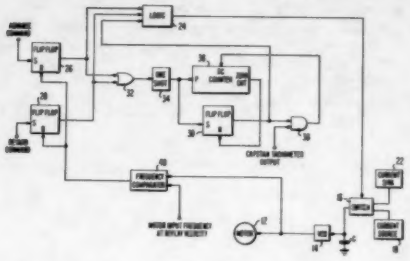
Filed Oct. 27, 1980, Ser. No. 201,055

Int. Cl.³ G11B *19/26*

U.S. Cl. 360—73 **8 Claims**

1. A replay system for use with a recorded medium, said system comprising a medium driving means for initially moving said recorded medium at its normal velocity, input means for receiving an external reference clock, and

control means coupled to said driving means and to said input means for receiving an external reference clock for changing the velocity of the recorded medium from the normal replay velocity during a first interval and immediately thereafter changing the velocity of the recorded medium back to the normal replay velocity during a sec-



ond interval of equal duration with said first interval to thereby temporarily step the velocity of the recorded medium relative the normal playback velocity within specific reference clock and position increments.

4,393,422

DEVICE FOR DRIVING MAGNETIC TAPE

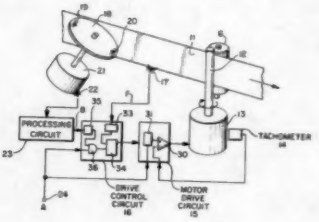
Nobuyoshi Yokobori, Osaka; Masashi Urayama, Neyagawa; Hiroshi Okamoto, Yao, and Yoshiaki Igarashi, Ikomashi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 2, 1981, Ser. No. 250,296

Claims priority, application Japan, Apr. 2, 1980, 55-43956

Int. Cl.³ G11B *15/52, 19/28*

U.S. Cl. 360—73 **1 Claim**



1. A device for intermittently driving a magnetic tape comprising:

a capstan for driving said magnetic tape;

a motor directly connected to said capstan for driving the capstan;

a tachometer for detecting the rotating speed of said motor and producing an output;

a speed control means having a settable speed means for setting a desired motor speed and into which the output from said tachometer is fed back for enabling said speed control means to sense when said motor is rotating at the desired motor speed;

an intermittent drive control means for supplying a triggering signal to trigger said settable speed means to cause said settable speed means to operate said speed control means for accelerating said motor to the desired motor speed and driving it at said speed, said intermittent drive control means including means for generating said triggering signal in response to a speed setting signal and a head switch signal; and

means for detecting a control signal recorded on said magnetic tape while said motor is being driven at said desired

speed and connected to said intermittent drive control means;

said intermittent drive control means further having means responsive to the detection of said control signal for discontinuing said triggering signal after the passage of a predetermined period of time for causing said settable speed means to decelerate the driving of said motor from said desired motor speed, whereby the position of said magnetic tape relative to the position of the recorded control pulse at the end of the deceleration by said speed control means is constant.

4,393,423

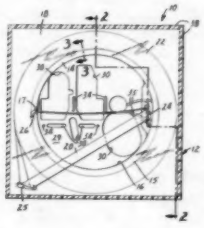
ENDLESS LOOP TAPE MAGAZINE, AND A RECORDING AND/OR PLAYBACK MACHINE UTILIZING THE MAGAZINE

Alfred H. Moris, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 27,312, Apr. 5, 1979, Pat. No. 4,293,882, which is a continuation of Ser. No. 820,250, Jul. 29, 1977, abandoned. This application May 11, 1981, Ser. No. 262,311

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—93 **2 Claims**



1. In combination:

a magazine comprising:

a housing comprising a cylindrical hub having a central opening and a slot extending axially across the full width of the hub and communicating with said central opening, and first and second spaced opposed flanges extending radially outwardly from said hub; and

an endless length of strip material having a major portion wrapped about said hub between said flanges and a minor portion extending from the innermost wrap of the coil through said slot, partially across said central opening and around the side surface of the coil to the outermost wrap of the coil;

said flanges being spaced by a dimension exceeding the width of said strip material in the range of about 0.025 inch to about 0.05 inch to provide a space between the coil and the flanges, which space allows shifting of said coil axially along said hub;

a recording and/or playback machine comprising:

means defining a station for releasably receiving said magazine;

drive means having members within said central opening of the magazine received in said station and in driving engagement with said minor portion of said strip material for pulling said strip material through said slot from said innermost wrap with the edges of said strip material between said drive mechanism and said hub generally coplanar with the edges of said coil;

a transducer positioned within said central opening of the magazine received in said station and said strip material between said drive mechanism and the slot in said hub; and

means within said central opening of the magazine received in said station for guiding said strip material in a precise predetermined path along said transducer;

said means for defining a station being adapted to position said magazine so that the spacing between said flanges will afford axial shifting of said coil to align the edges of said coil with the edges of the strip material along said means for guiding to compensate for misalignment of said magazine with said means for receiving and dimensional irregularities in said magazine.

4,393,424

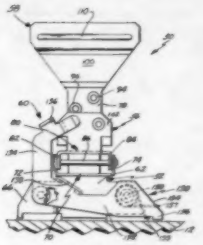
PRESSURE ARM ASSEMBLY FOR DISC RECORDERS

Mohan P. Vidwans, Saline, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 50,704, Jun. 21, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,587

Int. Cl.³ G11B *5/54, 25/04*

U.S. Cl. 360—105 **19 Claims**



1. A pressure arm assembly adapted for use in a data recorder of the type including a base, a diskette holder pivotally mounted to the base, a head support assembly carrying at least one head thereon and being adjustably mounted on the recorder to move the head into and out of operation contact with a disc medium positioned within the holder, and drive means engaging the head support for translating the head support and hence the head along the disc medium, said pressure arm assembly comprising:

a bracket adapted to be secured to the base of the data recorder;

a pressure arm;

means for pivotally connecting said pressure arm to said bracket and for permitting a portion of said pressure arm to rotate towards and away from the head support assembly;

resilient mechancial means for biasing the pressure arm towards the head support assembly; and

a release member carried by the bracket and being movable with respect to said pressure arm, said release member having a first position wherein said release member abuts said pressure arm and holds the pressure arm away from said head support assembly against the bias of said resilient mechanical means, and a second position wherein said release member disengages said pressure arm upon insertion of a diskette into the diskette holder, thereby permitting said resilient mechanical means to move said pressure arm into engagement with the head support assembly and force the head into operative contact with the disc medium.

4,393,425

LINEAR HEAD ACTUATOR

Harold T. Wright, San Carlos, Calif., assignor to Disctron, Inc., Milpitas, Calif.

Filed Mar. 30, 1981, Ser. No. 248,809

Int. Cl.³ G11B *5/54, 21/24*

U.S. Cl. 360—105 **6 Claims**

1. An actuator for translating at least one magnetic head comprising:

a moveable carriage element carrying said at least one mag-

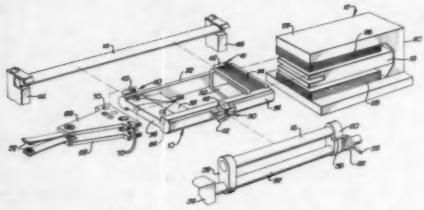
netic head having two parallel sides, a closed end and an open end, said carriage element being generally U-shaped and carrying bearing means located along the outside of each of said two parallel sides;

a stationary first guide rod adjacent and parallel to a first of said two parallel sides of said moveable carriage element cooperating with said bearing means located along said first of said two parallel sides;

a second guide rod adjacent and parallel to the second of said two parallel sides of said moveable carriage element cooperating with said bearing means located along said second of said two parallel sides, said second guide rod being non-moveable in a direction along its length, said carriage element being moveable linearly on said bearing means along said guide rods;

biasing means spaced from said moveable carriage for forcing said second guide rod against said bearing means located along said second of two parallel sides;

an electrical coil mounted across said open end of said moveable carriage element, said coil oriented in a plane generally perpendicular to the parallel sides of the moveable carriage element; and



a stationary magnet structure positioned between said stationary first guide rod and said second guide rod, said stationary magnet structure having a first member extending within said coil and between said parallel sides of said moveable carriage element, said coil being moveable along almost the entire length of said first member, said stationary magnet structure having at least one other member in addition to said first member extending outside said coil parallel to said first member and connected to said first member at one end, said members defining a magnetic flux path with a magnetic flux gap therebetween in which said coil is located so that when current passes through said coil, magnetic flux crossing said gap will cause said coil to experience a force, said force causing said coil to move along said first member extending within said coil, the direction of movement of said coil depending on the direction of said current in said coil, thereby moving said moveable carriage element along said guide rods.

4,393,426

TAPE RECORDER HEAD ADJUSTING MECHANISM

Yasuyuki Nakanishi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,989

Claims priority, application Japan, May 16, 1980, 55/65728

Int. Cl.³ G11B *5/54, 21/22*

U.S. Cl. 360—105 **3 Claims**

1. A tape recorder head adjusting mechanism comprising:

a movable pin constrained for reciprocation along a path,

means for intersecting a recording tape with said path,

a head base including means for moving said head base with said pin,

a head fixed to said head base, whereby said head is movable towards and away from said recording tape along said path,

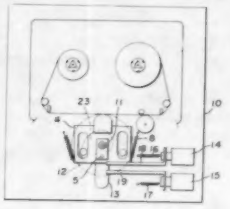
a cam rotatable about an axis transverse to said path,

means for biasing said pin into contact with a cam surface of said cam,

means for rotating said cam about said axis, whereby rotation of said cam causes said pin, said head base and said head to move along said path,

first and second movable plates reciprocatable in a first direction transverse to said path,

means for selectively moving said first plate into intersection with said path at a first position along said path, and



means for selectively moving said second plate into intersection with said path at a second position, spaced from said first position, along said path, whereby either said cam, said first plate or said second plate can selectively restrain said pin in one of three positions along said path, so that said head can be selectively restrained in three positions relative to said tape.

4,393,427

MULTICHANNEL MAGNETIC HEAD

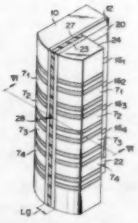
Yoshifumi Sakurai, Minoo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 220,197

Claims priority, application Japan, Jan. 18, 1980, 55-4303

Int. Cl.³ G11B *5/38, 5/12, 5/22*

U.S. Cl. 360—112 **7 Claims**



1. A multichannel magnetic head means comprising:

magnetic circuit means including a gap for detecting a magnetic flux and adapted to lead said magnetic flux;

an amorphous magnetic thin film held in said gap and consisting essentially of an alloy containing a rare earth element and a transition metal, said thin film having a single pair of current terminals and a plurality of Hall voltage terminals;

said amorphous thin film being arranged such that its surface is positioned substantially normal to the direction of the magnetic flux to be detected, and the composition ratio of said rare earth element is selected to be within a range of from about 10 to about 40 atomic percent so that said amorphous thin film has a magnetic anisotropy in a direction substantially normal to the surface thereof;

current leading means connected to said single pair of current terminals for leading a biasing current of said thin film along said gap;

the spacing between adjacent ones of said Hall voltage

terminals for outputting said Hall voltage being more than about four times the width of said amorphous thin film so that crosstalk between channels due to domain wall motion is substantially eliminated;

said magnetic circuit means comprising a first ferromagnetic block and a second ferromagnetic block, each of said first and second ferromagnetic blocks having one or more ferromagnetic shielding portions which are sandwiched between non-magnetic portions arranged on said magnetic circuit means, said magnetic circuit means of said first ferromagnetic block being face to face with said magnetic circuit means of said second ferromagnetic block, and said first and second ferromagnetic blocks holding said amorphous magnetic thin film therebetween; and

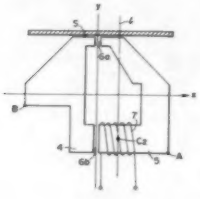
voltage outputting means connected to said Hall voltage terminals for outputting a Hall voltage for each channel corresponding to said magnetic flux, said voltage outputting means being provided in the corresponding number to the channels of said head and extending parallel to the direction in which said biasing current flows.

4,393,428

MAGNETIC HEAD

Masayuki Fujimura, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Jan. 30, 1981, Ser. No. 229,934
Claims priority, application Japan, Feb. 12, 1980, 55-16454
Int. Cl.³ G11B 5/20
U.S. Cl. 360—123 **5 Claims**



1. A magnetic head comprising:

first and second core segments together defining a confronting surface along which a recording medium may travel in confronting relation;

said first core segment being made of a high permeability substance and being formed with a first portion defining a section of said confronting surface and a first end surface facing toward an axis which is perpendicular to said confronting surface, said first core segment further being formed with a second portion disposed remote from said confronting surface and having a second end surface also facing toward said axis, said first core segment forming a part of a magnetic circuit;

a coil wound about said first core segment in the region of said second portion; and

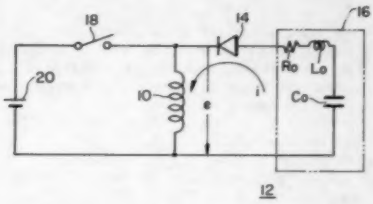
said second core segment being made of a high permeability substance and being disposed substantially in abutting relation with said first core segment to form a magnetic gap having one boundary defined by said first end surface and to form a remote gap having one boundary defined by said second end surface, said second core segment being asymetrical relative to said first core segment about a line which passes through said magnetic gap and said remote gap and forming another part of said magnetic circuit, said second core segment further being formed with a unitary projecting portion, projecting away from said axis, of shape and size to compensate for said coil wound on said first core segment and thus to provide for a magnetic balance line generated in said magnetic head to be approximately parallel to a line which passes through said magnetic gap and said remote gap.

4,393,429

SUPERCONDUCTIVE COIL SYSTEM WITH PROTECTING DEVICE

Naoki Maki, Tokai; Seiji Numata; Kiyoshi Yamaguchi, both of Ibaraki, and Heroe Yamamoto, Tokai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,375
Claims priority, application Japan, Apr. 24, 1980, 55/53618
Int. Cl.³ H03K 3/38
U.S. Cl. 361—19 **7 Claims**



1. A superconductive coil system comprising: a superconductive coil adapted to be energized when in a normal running operation by an energizing power source; and a protecting device connected in parallel with said superconductive coil for absorbing a portion of the magnetic energy of said superconductive coil when in the quenching operation of said superconductive coil,

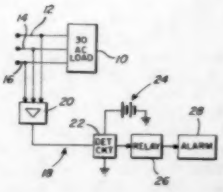
wherein said protecting device includes: a unidirectional current gate device for allowing a coil current to flow only in the same direction as that of the normal running operation when in the quenching operation of said superconductive coil; and a d.c. motor connected in series with said unidirectional current gate device.

4,393,430

MULTI-PHASE FAILURE DETECTOR

Jack H. Hughes, 4812 Lone Hill Rd., Chattanooga, Tenn. 37416

Filed Jun. 8, 1981, Ser. No. 271,190
Int. Cl.³ H02H 3/24
U.S. Cl. 361—92 **11 Claims**



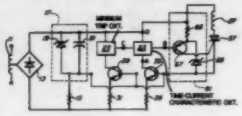
1. A protective system for electrical loads connected in delta or wye configuration by a plurality of power phase lines to an AC polyphase power supply, comprising rectifier means coupled to each of said power phase lines for establishing rectified phase currents that are time spaced in response to failure in at least one of the power phase lines, a source of DC voltage, means connecting said source to the rectifier means for insertion of a signal current only between the rectified phase currents that are time spaced and detector means connected to the rectifier means for sensing said inserted signal current between the phase currents that are time spaced reflecting said failure in at least one of the power phase lines.

4,393,431

OVERCURRENT RELAY CIRCUIT

Clyde Gilker, S. Milwaukee, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Apr. 23, 1980, Ser. No. 142,880
Int. Cl.[3] H02H 9/02
U.S. Cl. 361—97 13 Claims



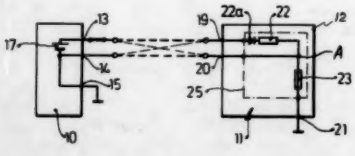
1. An overcurrent relay circuit comprising:
a relay trip coil to be energized when the AC current in a line being monitored exceeds a predetermined magnitude;
a current transformer to produce a signal proportional to the current in the line being monitored;
a rectifier to produce a DC signal from the output of said current transformer;
a test resistor across which a voltage indicative of the magnitude of the current in the line being monitored is developed by the output of said rectifier;
a minimum trip circuit responsive to the voltage developed across said test resistor to produce an output signal representative of the magnitude of the current in the line being monitored, after the magnitude of such current exceeds a predetermined level;
a time-current characteristic circuit responsive to the output signal of said minimum trip circuit to initiate energization of said relay trip coil with a time delay dependent upon the extent to which the magnitude of the current in the line being monitored exceeds the predetermined level including, a first RC timing circuit having a first timing capacitor and a first timing resistor with fixed capacitance and resistance values respectively, a first pair of operational amplifiers connected in an inverse feedback configuration between said first timing capacitor and said first timing resistor, and a first variable resistor connected to permit adjustment of the effective capacitance of said first timing capacitor upon changing the resistance of said first variable resistor; and
a power supply circuit in series with said test resistor to provide energizing power for said relay trip coil, said minimum trip circuit and said time-current characteristic circuit from the output of said rectifier.

4,393,432

SAFETY DEVICE FOR A CONDUCTING PATH IN A LOAD DEVICE

Dieter Neubaus, Sulzbach; Gerhard Sohner, Remshalden; Walter Ruf, Korntal-Munchingen; Erich Jesse, Marbach, and Helmut Roth, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 872,139, Jan. 25, 1978, abandoned. This application Feb. 21, 1980, Ser. No. 123,150
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703255; Oct. 27, 1977, 2748267
Int. Cl.[3] H02H 3/00, 7/20
U.S. Cl. 361—104 8 Claims



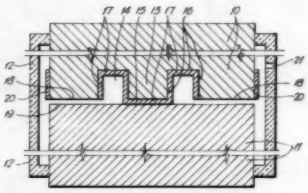
1. In combination with a user device and a current supply device, each device having at least two terminal connections and a ground connection, one of the terminal connections of the current supply device being connected to its ground connection, one of the terminal connections of the user device being connected to its ground connection, the other terminal connection of the user device being connected to a load element in the user device, a diode means in series with said load element between said other terminal of said user device and said load element; said load element also being connected to the ground connected terminal connection, of the user device said two terminal connections of both devices being engageable to produce a current flow, and a safety device within the user device connected between the ground connected terminal connection of the user device and the ground connection of the user device whereby during correct polarization of said user device, no current flows through said safety device, and during incorrect polarization of said user device said safety device operates to isolate said user device ground connection from said ground connected terminal connection.

4,393,433

OVERVOLTAGE PROTECTOR FOR TELEPHONE LINES

James E. Anderson, Almonte; John D. Lee, Manotick, and Frederick C. Livermore, Stittsville, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 16, 1981, Ser. No. 284,005
Int. Cl.[3] H02H 9/06
U.S. Cl. 361—119 18 Claims



1. An overvoltage protector comprising:
a tubular housing of dielectric material;
two electrodes in said housing, said electrodes each having an inner end surface, said inner end surfaces being in mutual opposition; said inner end surface of at least one of said electrodes comprising a central portion, an annular groove extending around said central portion, and an outer annular portion extending around said annular groove;
a dielectric layer extending across said central portion and at least partly into said annular groove, said dielectric layer being clamped between the juxtaposed central portions of said electrodes;
means for making electrical connections to said electrodes, wherein said outer annular portion is spaced from the corresponding opposed inner surface of the other of said electrodes to form a spark gap therebetween, said spark gap being substantially aligned laterally with the plane of said dielectric layer.

4,393,434

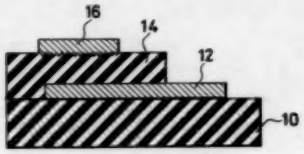
CAPACITANCE HUMIDITY SENSOR

Yoshio Imai, No. 3-36-3, Horinouchi, Suginami-Ku, Tokyo; Yoichi Nabeta, Machida, and Tadao Inuzuka, Kawasaki, all of Japan, assignors to Yoshio Imai, Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,586
Claims priority, application Japan, Dec. 16, 1980, 55-176504
Int. Cl.[3] H01G 7/00
U.S. Cl. 361—286 5 Claims

1. A capacitance humidity sensor which comprises a non-conductive base plate, electrodes oppositely arranged on the

base plate, a metal compound membrane formed by ion-plating independently on the electrodes, said metal compound membrane being roughened at its surface by plasma etching and



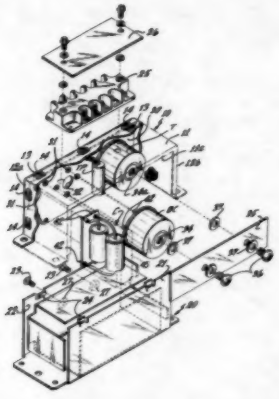
being active to the humidity, and a moisture permeable metal skin formed on the roughened surface of the metal compound membrane.

4,393,435

REPAIRABLE FLUORESCENT LAMP BALLAST

Robert J. Petrina, Anaheim, Calif., assignor to Bruce Industries, Inc., Gardena, Calif.

Filed Jul. 21, 1980, Ser. No. 170,899
Int. Cl.³ H05K 7/20
U.S. Cl. 361—377 **14 Claims**



1. A repairable ballast for fluorescent lamps, the ballast including at least one transformer, ballast coil means and capacitor means, and a support and mounting structure, comprising:

a metal, frame-like housing;

a metal cover on the housing and defining therewith a complete enclosure;

a printed circuit board having a plurality of sockets, the transformer, the coil means, and the capacitor means being provided with pins and being removably inserted respectively in the sockets of the plurality, the circuit board being mounted to the housing, becoming thereby part of said enclosure;

threaded means for additionally releasably securing the transformer and the coil means to the enclosure;

supplemental releasable means disposed for holding the capacitor means in place;

thermal conduction means in physical engagement with the coil means and the transformer, and in physical and releasable engagement with the surface portion of a metallic part of the enclosure; and

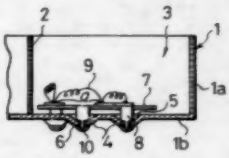
the coil means, the capacitor means, and the transformer being directly removable upon release of the threaded means by unplugging them from the board, the enclosure not being filled with any potting material.

4,393,436

CHASSIS ASSEMBLY

Shigekata Sugiura, and Susumu Kanno, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1980, Ser. No. 174,225
Claims priority, application Japan, Aug. 4, 1979, 54-107958[U]
Int. Cl.³ H05K 5/04
U.S. Cl. 361—380 **6 Claims**



1. A chassis assembly for electric components, comprising:

a main chassis made of a metallic material and having a plurality of recesses projecting outwardly from the bottom wall thereof, each of said recesses being provided with an aperture formed centrally therein; and

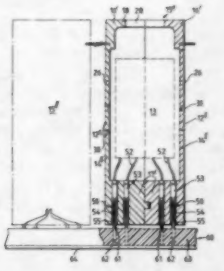
a sub-chassis carrying at least one electric part and having means including metallic legs adapted to be inserted into respective ones of said apertures with said legs being projected exteriorly through said apertures of said recesses so that said legs can be soldered to the outside of said main chassis for securing said sub-chassis within said main chassis.

4,393,437

COOLING MEANS FOR CIRCUIT ASSEMBLIES EACH INCLUDING HOLLOW STRUCTURES SPACED APART IN A CONTAINER

Melvyn R. Bell, Crossgates, and Charles D. Thomson, Edinburgh, both of Scotland, assignors to Ferranti Limited, Cheadle, England

Continuation of Ser. No. 92,454, Nov. 7, 1979, abandoned. This application Jul. 16, 1981, Ser. No. 284,095
Claims priority, application United Kingdom, Nov. 11, 1978, 44145/78
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 **15 Claims**



1. A circuit assembly having a plurality of subassembly units, each subassembly unit having a planar substrate, with constituent components of the circuit assembly being mounted on the substrates, the plurality of subassembly units being connected together to complete the required circuit, the circuit assembly also having a plurality of identical, substantially enclosed, hollow structures, the substrate of each subassembly unit considered individually comprising at least part of a wall of a substantially enclosed hollow structure, at least one substrate

being included in each such structure, the constituent plurality of structures being mounted spaced apart from each other within an at least substantially enclosed container, one other wall of each structure providing part of a closure wall for the container, the container closure wall defining passages communicating with the interiors of the structures, the other container walls defining at least one further passage communicating with the regions within the container surrounding the structures, the walls of the structures within the container defining holes communicating with both the interiors of the structures and the regions within the container surrounding the structures, and there being provided a supply of cooling fluid connected to at least one passage defined by a container wall, there being a flow of cooling fluid through the container, between the interiors of the hollow structures and the regions within the container surrounding the structures, the arrangement being such that the holes defined by the walls of the hollow structures within the container cause the cooling fluid to flow directly over said components of the circuit assembly which are spaced from the holes and which generate heat, each of the hollow structures having a plurality of spaced, readily removable portions providing the holes when removed for the flow of cooling fluid between the regions within the container surrounding the hollow structures, and within each hollow structure.

4,393,438

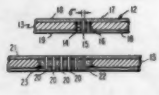
PORCELAIN COATED METAL BOARDS HAVING INTERCONNECTIONS BETWEEN THE FACE AND REVERSE SURFACES THEREOF

Robert L. Schelborn, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 133,255, Mar. 24, 1980, Pat. No. 4,328,614. This application Dec. 7, 1981, Ser. No. 328,435

Int. Cl.³ H05K *1/18*

U.S. Cl. 361—401 **1 Claim**



1. A porcelain coated metal board of a given thickness comprised of, in combination, a metal core having defined therein an aperture of a predetermined cross-sectional size, a connector having a length sufficient to extend through at least the entire thickness of said board and having a cross-sectional size less than said predetermined cross-sectional size of the aperture, a glass sealing member and first and second porcelain layers, said metal core being positioned between said porcelain layers, said connector being positioned within said aperture in a spaced apart relationship from the edges of the aperture and being oriented so as to extend through the entire thickness of said board, said glass sealing member being formed in the aperture between the connector and the edges of the aperture thereby holding said connector in said position relative to the metal core and said first and second layers of porcelain being formed about said connector in a flat configuration.

4,393,439

CONVERTIBLE LANTERN AND REFLECTOR THEREFOR

Harry E. James Jr., 75 Forbes Rd., Bedford, Ohio 44146

Filed Jul. 23, 1980, Ser. No. 171,307

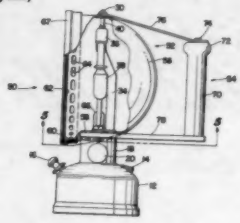
Int. Cl.³ F21V *17/00*

U.S. Cl. 362—182 **11 Claims**

1. A reflector for use with a portable lantern having a base portion, a light-emitting element positioned above the base portion, and a translucent housing surrounding the light-emitting element, the reflector adapted to replace the housing and enable the lantern to operate as a spotlight, comprising:

(a) a shell disposed about the light-emitting element, the shell having a light-reflective inner surface;

(b) openings in the shell to permit the ingress and egress of cooling air;



(c) a window secured to the open side of the shell; and

(d) a handle attached to the lantern by which the lantern can be readily maneuvered, the handle being positioned on that side of the shell opposite the window.

4,393,440

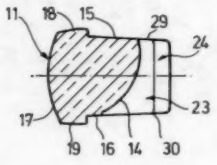
COVER ASSEMBLY FOR AIRPORT GUIDANCE LIGHT

Jacques L. Yperman, Kraainhem, Belgium, assignor to Societe Anonyme des Etablissements Adrien de Backer, Brussels, Belgium

Filed Mar. 15, 1982, Ser. No. 358,278

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—309 **3 Claims**



1. A cover assembly for an airport runway guidance light, comprising a cover having a plurality of holes for securement on top of a light base, said cover having a central top portion formed with at least one window for the exit light beam and an upwardly inclined ramp in front of said at least one aperture; and

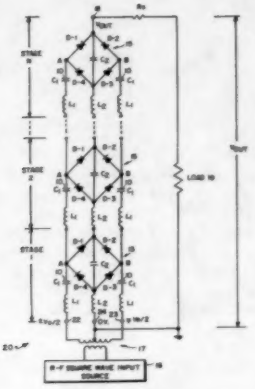
optical system means comprising a light source and at least one lens means hermetically mounted in said at least one window for the exit light beam,

said lens means having a central refracting portion end two lateral total reflecting portions,

the central refracting portion being formed with a first surface with double curvature towards the light source with flat upper and lower faces and a second surface with double curvature on its outer side with flat upper and lower faces,

the lateral total reflecting portions being each formed with indentations protruding towards the light source in symmetric relation with respect to the optical axis of the exit light beam, each indentation having a curved face towards the light source, an inclined planar face transversal to the optical axis, and flat upper and lower faces, and each of said lateral portions having each a planar surface extending perpendicular to the optical axis on the outer side of the lens.

4,393,441
HIGH VOLTAGE POWER SUPPLY
Harald A. Enge, 26 Prince Ave., Winchester, Mass. 01980
Filed Jul. 17, 1981, Ser. No. 284,483
Int. Cl.³ H02M 7/10
U.S. Cl. 363—61 **14 Claims**



1. A power supply for producing a DC output voltage comprising

a plurality of serially-connected voltage producing stages including a first stage, a final stage, and intermediate stages therebetween, each of said stages including

bridge rectifier means having first and second side-string terminals and first and second center-string terminals;

a first circuit having series-connected, side-string capacitance and inductance means;

a second circuit having series-connected, side-string capacitance and inductance means; and

center-string capacitance means connected between said center-string terminals;

an AC input voltage source, having a pair of output terminals for supplying an AC voltage having a substantially square wave shape;

the first circuit of said first stage connected between one of the output terminals of said AC input voltage source and the first side-string terminal of the first stage bridge rectifier means;

the second circuit of said first stage connected between the other of the output terminals of said AC input voltage source and the second side-string terminal of the first stage bridge rectifier means;

the first center-string terminal of the bridge rectifier means of said first stage being connected to a first DC output terminal;

the first circuit of each successive stage connected between the first side-string terminal of its bridge rectifier means and the first side-string terminal of the bridge rectifier means of the preceding stage;

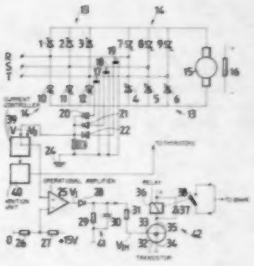
the second circuit of each successive stage being connected between the second side-string terminal of its bridge rectifier means and the second side-string terminal of the bridge rectifier means of the preceding stage;

center-string inductance means connected from the first center-string terminal of the bridge rectifier means of each successive stage to the second center-string terminal of the bridge rectifier means of the preceding stage and from the first center-string terminal of said first stage to the first DC output terminal;

the product of the values of the inductance means and the capacitance means of said first and second circuits of each of said stages and the product of the values of the center-string capacitance means and the center-string inductance means of each of said stages being selected to be substantially equal;

the center-string terminal of the bridge rectifier means of the final stage providing a second DC output terminal.

4,393,442
PROCEDURE AND MEANS FOR MONITORING CURRENT DATA IN A THYRISTOR-CONTROLLED DIRECT CURRENT DRIVE
Matti Kähkipuro, Hyvinkää, Finland, assignor to Elevator GmbH, Barr, Switzerland
Filed Dec. 22, 1980, Ser. No. 218,767
Claims priority, application Finland, Dec. 28, 1979, 794076
Int. Cl.³ H02M 7/17
U.S. Cl. 363—70 **4 Claims**



1. A method of monitoring current data in a thyristor controlled direct current drive circuit, comprising the steps of: applying three phase A.C. current to terminals R, S, T connected to inputs of a pair of parallel thyristor bridges; applying a D.C. current output to a D.C. motor electrically in circuit as a load; applying A.C. current to current sensing transformers in parallel relation to thyristor bridge inputs connected to three rectifying diodes and having D.C. output terminated across a resistor; feeding rectified A.C. to a current controller connected to an igniter unit, causing said igniter unit to fire said thyristors in proper timing sequence through action of said igniter unit, whereby the output D.C. current of said thyristor bridges exhibit proper amplitude and polarity, causing said D.C. motor to operate; feeding voltage generated across said resistor to an operational amplifier and feeding its output to a time delay circuit; directing the output voltage of said delay circuit to an emergency stop circuit, employing a relay having associated contacts responsive to said output voltage, whereby, a zero voltage condition in excess of a predetermined time, energizes said relay causing said contacts to close and indicate a stop condition.

4,393,443
MEMORY MAPPING SYSTEM
John Lewis, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed May 20, 1980, Ser. No. 151,541
Int. Cl.³ G06F 9/36
U.S. Cl. 364—200 **10 Claims**

1. A memory mapping system comprising:

a first address bus portion having a first set of n lines and a second set of x lines, for receiving logical address information;

a second address bus portion for providing physical address information to main memory means of a computer, said second address bus portion having a first set of N lines, where N is greater than n, and a second set of x lines connected to the second set of x lines of the first address bus portion;

random access memory means having n input lines con-

nected to the first set of n lines of the first address bus portion and N output lines connected to the first set of N lines of the second address bus portion, said random access memory means having a plurality of memory regions which are individually selectable for connection to said n input lines and to said N output lines, and each memory region being operative, when selected, to transform information provided on said n input into information on said N output lines; and

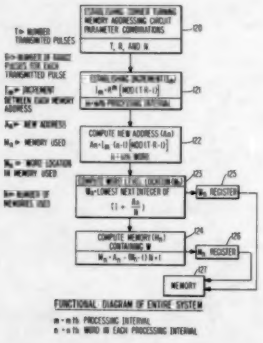
a control register having input means for receiving data and output means at which said data is made available and operatively connected to the random access memory means for utilizing said data to select which one of the plurality of memory regions is connected to said n input lines and to said N output lines.

4,393,444

MEMORY ADDRESSING CIRCUIT FOR CONVERTING SEQUENTIAL INPUT DATA TO INTERLEAVED OUTPUT DATA SEQUENCE USING MULTIPLE MEMORIES

Leonard Weinberg, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 6, 1980, Ser. No. 204,694
Int. Cl.[3] G06F 7/00; G01S 7/44
U.S. Cl. 364—200 8 Claims



1. A system for converting sequentially received data words, in the form of successive groups of data words, into an interleaved output data word sequence, with each group of received data words consisting of T successive series of R data words, said system comprising:

N memories each having W word location levels, where $W \cdot N \geq T \cdot R$;

first logic means for writing successively received data words of any given group of data words into word location levels of successive ones of said N memories in a predetermined sequence such that successive data words are not written into the same memory;

means for reading from said memories every R^{th} data word of said given group of data words written into said memories to leave an available word location level in each instance where a data word was read therefrom; and

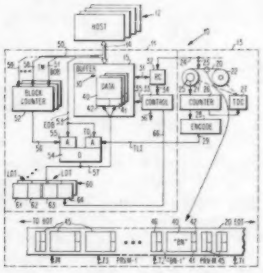
said first logic means comprising other logic means for writing successively received data words of the next and each subsequently received group of data words into the successively occurring available word location levels as they occur in the predetermined sequence of N memories, during the concurrent reading therefrom, of the data words of the immediately preceding given group of data words.

4,393,445

INFORMATION-SIGNAL RECORDING APPARATUS EMPLOYING RECORD VOLUME ORIENTED IDENTIFICATION SIGNALS

Charles A. Milligan, St. David; Edwin R. Videki, II, and Winston F. Yates, both of Tucson, all of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,172
Int. Cl.[3] G06F 13/04; G11B 15/18
U.S. Cl. 364—200 3 Claims



1. A record storage subsystem having a plurality of addressable signal recorder apparatus, each of said signal recorder apparatus capable of mounting a record volume for transducing operations hereinafter referred to as a mounted record volume, transducing means in each said signal recorder apparatus and being relatively movable with respect to said record volume for enabling transducing operations, a buffer memory connected to all of said signal recorder apparatus for buffering signals to and from said signal recorder apparatus, said buffer memory being connectable to a signal source-sink means,

the improvement comprising:

a channel block counter means for each said signal record apparatus for counting block of said signals transferred between said signal source-sink means and said buffer memory,

a device block counter means for all of said signal recorder apparatus for counting blocks of said signals transferred between said buffer memory and said signal recorder apparatus, respectively,

PRV means in each said signal recorder apparatus for indicating present relative physical location of said mounted record volume and said transducing means, and

means connected to said buffer memory for storing the count in a given one of said block counter means and said PRV means in said buffer memory in a predetermined addressable location of said buffer memory such that the stored block of signals is logically contiguous with said predetermined addressable locations, respectively.

4,393,446

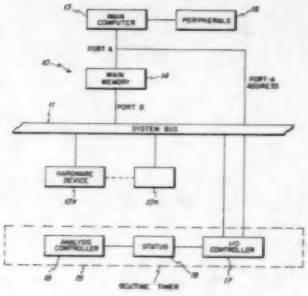
ROUTINE TIMER FOR COMPUTER SYSTEMS

George P. Gurr, Phoeniz, Ariz., and Robert M. Hardy, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 67,996, Aug. 20, 1979, abandoned. This application Apr. 27, 1981, Ser. No. 258,122

Int. Cl.³ G06F *11/30*

U.S. Cl. 364—200 26 Claims



14. A computer system for providing real-time servicing to a plurality of hardware devices comprising:

a main computer forprocessing a plurality of preprogrammed routines for servicing respective ones of said hardware devices;

a main memory coupled to said main computer to exchange data back and forth;

a routine timer located outside said main computer for simultaneously processing event timers called for by said preprogrammed routines run in said main computer simultaneously, said routine timer comprising means for monitoring said main computer during processing of said plurality of routines to detect predetermined memory access associated with said routines being processed;

input/output control means for sequencing the transfer of data containing the length of an event timer called for by a specific routine from said main memory to said input-/output control means and for providing signals indicative of event timer termination of a specific event timer to said main memory;

data analysis control means for processing information provided by said input/output control means by decrementing each event timer by a predetermined time segment and informing said input/output control when an event timer has terminated; and

means to control transfer of information between said input-/output control means and said data analysis control means.

4,393,447

METHOD AND A CIRCUIT FOR CONTROLLING THE PRESSURE IN WHEEL BRAKE CYLINDERS OF FLUID-OPERATED VEHICULAR BRAKES

Heinz Loreck, Moedling, Austria, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,405

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951756

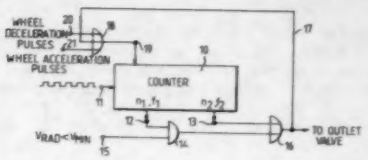
Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 8 Claims

1. In a method for controlling pressure in a wheel brake cylinder by a control pulse train proportional to acceleration or deceleration of an associated wheel controlling an outlet valve coupled to said cylinder, an improvement comprising the steps of:

monitoring said control pulse train during each control cycle;

generating at least one opening pulse for coupling to said



outlet valve whenever, after a first predetermined time interval, said pulse train is absent; and

stopping the generation of said opening pulse immediately upon re-occurrence of said pulse train.

4,393,448

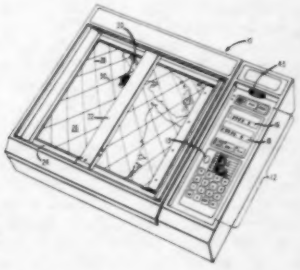
NAVIGATIONAL PLOTTING SYSTEM

Thomas J. Dunn, Ocean Bluffs; Donald G. Yuniskis, Jr., Arlington; Gabor L. Szakacs, West Roxbury, and Nghia V. Nguyen, Westwood, all of Mass., assignors to Epsco Incorporated, Westwood, Mass.

Filed Feb. 15, 1980, Ser. No. 121,651

Int. Cl.³ G06F *15/50*; G01S *5/14*

U.S. Cl. 364—449 16 Claims



12. A plotting system for use on board a vehicle in which said plotter is provided with navigation signals from a receiver at said vehicle comprising:

means for generating pen positioning signals in accordance with navigation signals from said receiver, said pen positioning signals being in the form of drive pulses;

an X/Y plotter having a moveable pen, a charting surface and stepping motor means coupled to said drive pulses for positioning said pen;

at least one counter coupled to said drive pulses for keeping track of the effective position of said pen by virtue of the count thereof;

means for increasing the rate of said drive pulses to said counter when the position dictated by said pen positioning signals indicate a pen move within the off-chart area; and,

means for interrupting the coupling of said drive pulses to said stepping motor means when the effective position of said pen is off-chart, said interrupting means including an off-chart counter, means for coupling said drive pulses to said off-chart counter when said pen reaches a predetermined edge of said charting surface such that when said pen reaches an edge of said charting surface, said pen stops and the drive pulses are diverted to said off-chart counter, and means responsive to a predetermined count of said off-chart counter for controlling said coupling means to remove said drive pulses from said off-chart

counter and to apply said drive pulses to said stepping motor means.

4,393,449

NUMERICALLY CONTROLLED MACHINE TOOL

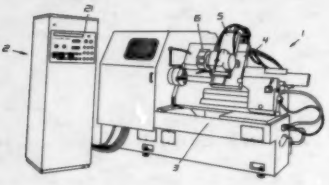
Koichi Takeda, Takarazuka, and Yoshiro Sasano, Yawata, both of Japan, assignors to Daihatsu Motor Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Jun. 5, 1980, Ser. No. 156,654

Claims priority, application Japan, Jun. 14, 1979, 54-75241; Oct. 2, 1979, 54-127594

Int. Cl.³ G05B *19/42*

U.S. Cl. 364—474 **3 Claims**



1. A numerically controlled lathe comprising a control means including an operation panel having key switch means arranged thereon, said key switch means inputting data on the finished shape and finished dimensions of a workpiece and on the machining conditions thereof including spindle rpm and feed rate, said control means, on receiving said input data, automatically preparing a machining program; a tool rest means, movable longitudinally and transversely in the lathe with respect to a reference point in the lathe, tool rest arrival detecting means for turning on when said tool rest arrives at predetermined positions located longitudinally and transversely in the lathe and at the same time emitting signals indicating the arrival, and tool rest position detecting means for emitting a series of equispaced signals in accordance with the longitudinal or transverse movement of said tool rest, wherein said machining reference point corresponds to the position of said tool rest when said tool rest position detecting means emits a signal for the first time after said tool rest arrival detecting means has been turned on, said control means controlling the amount and direction of movement of said tool rest means, thereby controlling the lathe to automatically process a workpiece to a desired shape, wherein said control means includes indicating means for indicating in conversational language, the kinds and sequence of numerical values to be inputted into and control means, and said key switch means includes function keys for designating a shape to be machined, and numerical keys for inputting specific numerical values in accordance with the output of said indicating means.

4,393,450

THREE-DIMENSIONAL MODEL-MAKING SYSTEM

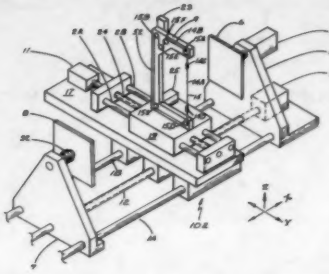
Robert B. Jerard, Lebanon, N.H., assignor to Trustees of Dartmouth College, Hanover, N.H.

Filed Aug. 11, 1980, Ser. No. 177,264

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—474 **29 Claims**

1. A three-dimensional model-making machine to form a model of predetermined shape from an easily machinable material, that comprises: a wire under tension; means for effecting translational positional changes in the wire in the x and y directions; means to receive said easily machinable material and operable to effect rotary indexing positional orientation of the material; and means to effect reciprocating motion of the wire perpendicular to the x and y directions to cut the material, the translational movement of the reciprocating wire coupled



with the indexing serving to contour the easily-machinable material to form a complex three-dimensional shape.

4,393,451

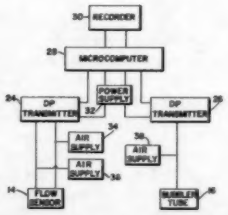
METHOD AND APPARATUS FOR MEASURING TOTAL LIQUID VOLUME FLOW

Leland W. Barker, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1981, Ser. No. 235,386

Int. Cl.³ G01F *7/00*

U.S. Cl. 364—510 **8 Claims**



1. The method of determining total volume flow of a liquid in a partially full cylindrical pipe, the method comprising

measuring at a predetermined location along the length of said cylindrical pipe the average fluid velocity of the liquid flowing through said cylindrical pipe by making measurements at intervals transversely across the flow of liquid in the cylindrical pipe and determining therefrom said average fluid velocity and generating an electrical output signal representative of this measurement;

measuring the depth of liquid at said predetermined location in said cylindrical pipe and generating an electrical signal representative of this measurement; and

feeding the electrical output signals from said average fluid velocity and from said depth of liquid measurements to a programmable digital microcomputer and thereby calculating the total volume flow of said liquid by solving the following equation:

$$\text{Flow} = 1.68\sqrt{dp}\left\{\frac{\pi R^2}{2} - \left[(R-D)\sqrt{D(2R-D)} + R^2\left(\frac{R-D}{R} + 0.166\left(\frac{R-D}{R}\right)^3\right) + \right.\right.$$

-continued

$$0.075\left(\frac{R-D}{R}\right)^5+0.045\left(\frac{R-D}{R}\right)^7\Big)\Big]\Big)\ \text{ft.}^3/\text{sec.}$$

wherein the terms are defined as

dp=proportional to the average velocity of flowing fluid

R=radius of pipe

D=depth of the liquid.

4,393,452

METHOD OF REPRODUCING A PICTURE HAVING IMPROVED RESOLUTION

Keiji Sekigawa, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

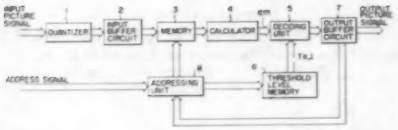
Filed Jun. 2, 1980, Ser. No. 155,179

Claims priority, application Japan, Jun. 2, 1979, 54-69040

The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.

Int. Cl.³ G06F *15/20*; H04N *5/14*

U.S. Cl. 364—514 **1 Claim**



1. A method of reproducing a picture including half-tones through estimation with binary outputs, wherein said picture is divided into a predetermined number of picture elements defining a matrix and each picture element within said matrix is assigned a density level, comprising the steps of:

subdividing said matrix of picture elemtns into plural 2×2 sub-matrices;

converting each 2×2 sub-matrix into a higher resolution 3×3 sub-matrix of picture elements, comprising,

calculating density levels for each of said picture elements in said 3×3 sub-matrix according to predetermined equations including weight factors for each of the density levels of said picture elements in the 2×2 sub-matrix and those of the picture elements surrounding said 2×2 sub-matrix;

comparing the calculated density levels with respective predetermined threshold levels, thereby to determine an output level of each picture element of each of said 3×3 sub-matrices is black or white in dependence on whether or not the calculated density levels exceed the predetermined threshold levels, and

reproducing said picture based on the respective output levels of each of said picture elements of each of said 3×3 matrices determined in said comparing step; in which said predetermined equations are

$$q_1=a_1\cdot Q_1+a_2\cdot Q_2+a_2\cdot Q_5+a_3\cdot Q_6$$

$$q_2=a_6\cdot Q_2+a_6\cdot Q_3+a_4\cdot Q_6+a_4\cdot Q_7$$

$$q_3=a_2\cdot Q_3+a_1\cdot Q_4+a_3\cdot Q_7+a_2\cdot Q_8$$

$$q_4=a_6\cdot Q_5+a_4\cdot Q_6+a_6\cdot Q_9+a_4\cdot Q_{10}$$

$$q_5=a_5\cdot Q_6+a_5\cdot Q_7+a_5\cdot Q_{10}+a_5\cdot Q_{11}$$

$$q_6=a_4\cdot Q_7+a_6\cdot Q_8+a_4\cdot Q_{11}+a_6\cdot Q_{12}$$

$$q_7=a_2\cdot Q_9+a_3\cdot Q_{10}+a_1\cdot Q_{13}+a_2\cdot Q_{14}$$

$$q_8=a_4\cdot Q_{10}+a_4\cdot Q_{11}+a_6\cdot Q_{14}+a_6\cdot Q_{15}$$

$$q_9=a_3\cdot Q_{11}+a_2\cdot Q_{12}+a_2\cdot Q_{15}+a_1\cdot Q_{16}$$

where q_1 through q_9 are the calculated density levels of said picture elements of said 3×3 matrix, Q_1 through Q_{16} are the density levels of said picture elements in said 2×2 sub-matrix and of said picture elements surrounding said 2×2 sub-matrix and are expressed in multi-base quantization, and a_1 through a_6 are the weight factors for said minute picture elements, with $a_1+2a_2+a_3=1$, $2a_6+2a_4=1$ and $4a_5=1$.

4,393,453

REGION INFORMATION PROCESSING SYSTEM

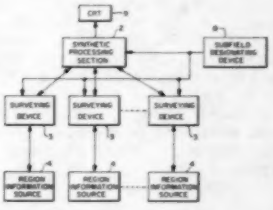
Akira Nakano, 13-13, Mita 2-Chome, Meguro-ku, Tokyo-to, Japan

Continuation-in-part of Ser. No. 45,261, Jun. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 915,185, Jun. 14, 1978, abandoned. This application Apr. 28, 1981, Ser. No. 258,276

Claims priority, application Japan, Jun. 20, 1977, 52-72978

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—514 **11 Claims**



1. A region information processing system for processing information concerning a plurality of objective regions in a field to produce information concerning at least one synthetic region to be formed by combining by synthesis the information concerning each of the objective regions being provided by external region information source means, the region information processing system comprising:

(a) subfield designating means for sequentially designating subfields each constituting part of the field, by providing, one at a time, subfield designating data,

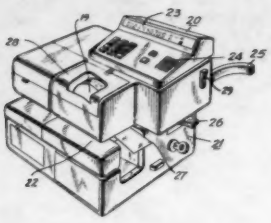
(b) a plurality of surveying means each associated with a corresponding one of the regions and each responsive to the subfield designating data for examining the region information source means to produce local data of the subfield being designated concerning the associated region, the local data including at least region flag data indicating whether or not the subfield is inside the boundary of the associated region, and

(c) synthesizing means responsive to the local data of the subfield concerning the objective regions for producing local data of the synthetic region including at least region flag data indicating whether or not the subfield being designated is inside the synthetic region, said synthesizing means judging whether or not the local data of the subfield concerning the objective regions satisfy a predetermined condition to determine depending on the result of the judgement, the significance of the region flag data of the synthetic region.

4,393,454
ELECTRONIC PARCEL REGISTER

John H. Soderberg, Monroe, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 14, 1981, Ser. No. 224,875
Int. Cl.³ G06K 15/00
U.S. Cl. 364—518 19 Claims

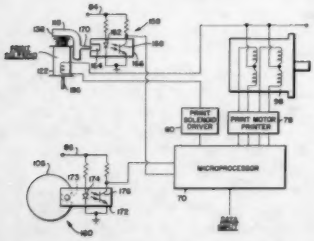


1. A parcel register having a data entry and display keyboard, an accounting module, and a printing module, which printing module includes means for controlling a first set of print wheels that are operative to print a value upon a tape and a second set of wheels that has means for printing a series of consecutive numbers of successive tapes, comprising: a first microprocessor for controlling data entry and display of said keyboard, a second microprocessor for controlling arithmetic operations in said accounting module, and a third microprocessor for controlling the operation of said printing module in accordance with instructions from said second microprocessor, said printing module having means responsive to an input into said keyboard for selecting a first value to be printed on a first tape by said first set of print wheels and means for printing a number from sequence of numbers on said first tape by said second set of print wheels and means for selecting a second value for printing upon a second tape and for inhibiting said series sequence means of said second set of print wheels causing said second set of print wheels to print on said second tape the same number from a sequence of numbers as printed on said first tape.

4,393,455
MODULAR ELECTRONIC MEASURING AND PRINTING UNIT

Alec T. Douglas, and James S. Havers, both of St. Johnsbury, Vt., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,279
Int. Cl.³ B41J 3/12; G06K 15/10
U.S. Cl. 364—519 28 Claims

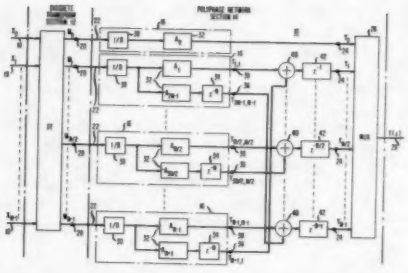


1. A moving dot matrix printer for forming alpha and numeric characters on a recording medium comprising support means, elongated mounting means mounted upon said support means, a unitary print assembly means mounted upon said elongated mounting means for movement in a first path along said elongated mounting means between a start and a stop position, said unitary print assembly means being operative to mark an adjacent record medium, printer drive means operative during the formation of a character to selectively move said unitary print assembly means along said elongated mounting means between spaced points in said first path, said printer drive means including movable cam means mounted to contact said unitary print assembly means, said cam means operating to move said unitary print assembly means in said first path and bias means mounted to engage and bias said unitary print assembly means toward and into engagement with said movable cam means, record medium drive means mounted upon said support means and operative to position a record medium relative to said unitary print assembly means for marking thereby, said record medium drive means operating during the formation of a character to move said record medium in a second path transverse to the first path of movement of said unitary print assembly means.

4,393,456
DIGITAL FILTER BANK

Thomas G. Marshall, Jr., Princeton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 19, 1981, Ser. No. 245,194
Int. Cl.³ G06F 15/31
U.S. Cl. 364—724 5 Claims



1. A digital filter bank of the type including a discrete transform means connected to a polyphase network comprising at least one complementary pair of first and second digital filters, characterized in that each of said filters comprises:

a single input which provides a filter input signal during the course of a present sampling period;

at least a first output which during the present sampling period gives a first output signal value independent of the present sampling period filter input singal and dependent on the filter input signal of a previous sample period;

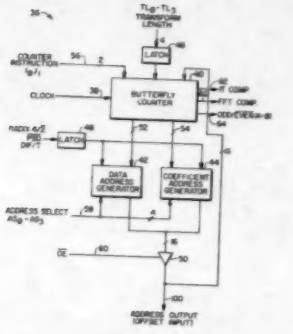
a second output which during the present sampling period gives an output signal value dependent in general on the value of the present filter input signal and

a shift register which for the present sampling period receives a register input signal dependent on the present filter input signal, said shift register including a first set of stages comprising a first stage and every other one of a plurality of successive stages and including a second set of stages comprising a second stage and every other one of said plurality of successive stages, said first filter output being accumulated from weighted values of said first set of stages and said second filter output being accumulated from the weighted value of said register input signal and weighted values of said second set of stages.

4,393,457
METHOD AND APPARATUS FOR SEQUENCING ADDRESSES OF A FAST FOURIER TRANSFORM ARRAY

Bernard J. New, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 26, 1981, Ser. No. 247,676
Int. Cl.³ G06F *15/34*
U.S. Cl. 364—726 **13 Claims**



1. For use in a digital signal processor, an intergrated circuit apparatus operative in response to signals from clock means, said clock means establishing a clock cycle, for generating signals representative of nonconsecutive sequence of output position values for data addresses according to a preselected pattern in order to read and write related data of an array in digital memory means, said apparatus comprising:

first counting means for sequentially generating consecutive signals representing control values;

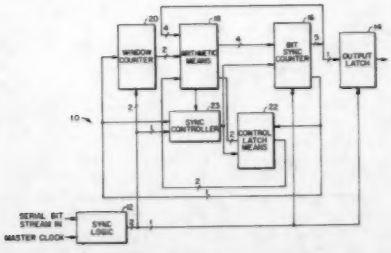
second counting means for sequentially generating consecutive signals representing binary seed values;

means coupled to said first counting means and to said second counting means for inserting at least one preselected binary value signal in a preselected bit position of each seed value signal at each clock signal, said preselected bit place position determined by a control value signal, in order to generate in a nonconsecutive value sequence said output position value signals.

4,393,458
DATA RECOVERY METHOD AND APPARATUS USING VARIABLE WINDOW

Anthony K. Fung, Fountain Valley, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 6, 1980, Ser. No. 118,882
Int. Cl.³ G06F *7/28*
U.S. Cl. 364—900 **13 Claims**



1. A method for recovering encoded digital information from a serialized bit stream wherein an information encoding scheme is employed having transitions indicative of defined state amplitude deviations capable of occurring at two distinguishable positions relative to synchronizable bit cell timing units of nominally constant duration, said method comprising the steps of:

providing a plurality of transition detection windows of nominally constant duration, said transition detection windows being of first and second types, each of said transition detection windows being nominally synchronized to the center of a corresponding bit cell timing unit;

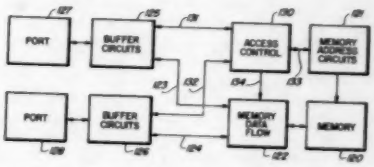
selectively expanding or contracting selected ones of said transition detection windows of said first type relative to the corresponding bit cell timing unit such that said transition detection windows of said first type tend to center at time locations of expected occurrence of state amplitude deviations representing a first value; and

selectively expanding or contracting said transition detection windows of said second type adjacent to said selected ones of said transition detection windows of said first type such that said transmission detection windows of said second type tend to center at time locations of expected occurrences of state amplitude deviations representing a second value.

4,393,459
STATUS REPORTING WITH ANCILLARY DATA

John D. Huntley, and Raymond L. Parsons, both of Tucson, Ariz., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,544
Int. Cl.³ G06F *13/00, 15/16*
U.S. Cl. 364—900 **1 Claim**



1. A data storage control for enabling verifiable controlled access to a data storage unit, comprising:

(a) a plurality of access port means coupled to said data storage unit for enabling access thereto for the storage and retrieval of data signals;

(b) an access control coupled to each of said access port means for controlling said access such that one and only one of said access port means accesses the data storage unit at a given instant and said access control having a register for storing a busy access-indicating control signal with access identification signals for indicating which of said access port means has current access rights to said data storage unit when and only when said busy control signal indicates a busy state;

(c) access means in said access control and coupled to said register for storing and retrieving signals therein and further coupled to all of said access port means for receiving access requests for accessing said data storage unit via the respective access port means and for setting said register in accordance with said received access requests such that said busy control signal is set on a given access request being received, together with an appropriate access identification signal and for denying access to a first access port means supplying an access request whenever said busy access signal indicates a busy state and the access identification signal does not correspond to said first access port means, read status means in said access control and coupled to said register for storing and retrieving

signals therein and to all of said access port means for enabling any of said access port means to read the signal contents of said register for monitoring access status of said data storage unit independent of any of said access requests such that an access port means currently having access to said data storage unit can verify that access and any other access port means not currently having access to said data storage units can monitor another port's access status for ensuring data integrity, read and set means in said access control and being coupled to said register for storing and retrieving signals therefrom and coupled to all of said access port means for receiving a read and set signal from any of said access port means for sensing the busy access signal and access identification signals stored in said register and being responsive to a received read and set signal and to said busy signal indicating a not busy signal to set the busy signal to the busy state and setting an access identification signal in said register corresponding to the access port means supplying such read and set command whereby access to the data storage unit can be established independent of other access requests, reset control means in said access control coupled to said register and to all of said access port means for being responsive to a reset command received from any of said access port means and being responsive to said reset command to reset the contents of said registers to a not busy state and erasing all of said access identification signals irrespective of the current stored signals in said register whereby any of said access port means can reset the access control for facilitating access thereto, and free resource control means in said access control coupled to said register for storing signals therein and retrieving signals in said register and to all of said access port means for receiving a free resource command from any of said access port means and being responsive to said received free resource command to compare the access port means supplying said free resource command with the presently stored access identification signal and if equal to reset the busy signal along with the access identification signal to zero, otherwise indicating an error state; and

(d) means in said access control connected to the register for comparing said busy signal with said access identification signal and indicating an error in said access control whenever any of said access identification signals are indicating which of said access port means has current access rights when said busy control signal is set to a non-busy state.

4,393,460

SIMULTANEOUS ELECTRONIC TRANSLATION DEVICE

Sigeaki Masuzawa, Nara, and Yoshiro Kihara, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1980, Ser. No. 186,610
Claims priority, application Japan, Sep. 14, 1979, 54-118569
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **9 Claims**

1. An electronic dictionary and language interpreter device wherein first words represented in a first language selected from a plurality of languages are entered to obtain second words represented in a second language selected from the plurality of languages, said second words being equivalent to the first words, said device comprising:

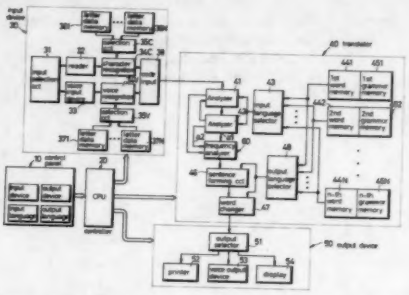
selection means for selecting the first language and the second language;

reader means for reading the first words and for entering the first words in the first language;

recognizing means responsive to said reader means for recognizing the first words;

translation means responsive to the recognizing means for translating the first words into the second words in the second language;

output means responsive to the translation means for providing the second words, the output means comprising a plurality of output devices; and



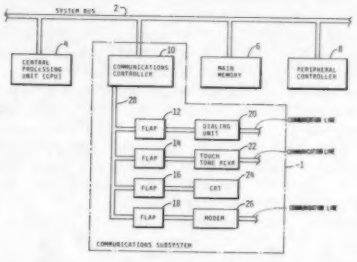
switching means actuated to select at least one of the plurality of output devices within the output means and to permit said output means to develop the second words.

4,393,461

COMMUNICATIONS SUBSYSTEM HAVING A SELF-LATCHING DATA MONITOR AND STORAGE DEVICE

Thomas O. Holtey, Newton; Steven S. Noyes, Boylston, and Daniel G. Peters, Billerica, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 6, 1980, Ser. No. 194,311
Int. Cl.³ G06F *3/05*
U.S. Cl. 364—900 **6 Claims**



1. In combination with a plurality of communication lines and a data processing system comprising a system bus, at least one central processing unit (CPU), one main memory, one peripheral controller and a communication subsystem, each individually coupled to said system bus, said communication subsystem including a communications controller and further including a modem, a dialing unit, a touch tone receiver, and a cathode ray tube display (CRT), each coupled to said communications controller, said modem, said dialing unit, and said touch tone receiver also coupled to said communication lines, said communications controller comprising:

(a) an address bus;

(b) a data bus;

(c) a microprocessor coupled to said address bus and data bus;

(d) universal synchronous receive transmit (USRT) means coupled to said data bus for transmitting data to and receiving data from said typical communication devices;

(e) baud rate generation means coupled to said data bus and said USRT for specifying the baud rate for transmission of said data for each of said typical communication devices directly connected to said communication subsystem and to indicate to said USRT the baud rate for transmission of

said data to each of said typical communication devices which are external to said communication subsystem;

(f) latching register means also coupled to said address bus, said microprocessor, said USRT means and said data bus for storing a plurality of signals received from said microprocessor and generating a direct connect mode signal, a clear to send signal and a bit oriented protocol (BOP) mode signal;

said USRT means being responsive to said direct connect mode signal for selecting a baud rate signal from said baud rate generation means for establishing the transmission rate of said data for said each of said typical communication devices directly connected to said communication subsystem;

said USRT means being responsive to said clear to send mode signal for transmitting said data to a selected one of said typical communication devices; and

said USRT means being responsive to said BOP mode signal for establishing said data transmission between said USRT and said selected one of said typical communication devices in a BOP mode.

4,393,462

ELECTRONIC TRANSLATOR WITH MEANS FOR PRONOUNCING INPUT WORDS AND TRANSLATED WORDS

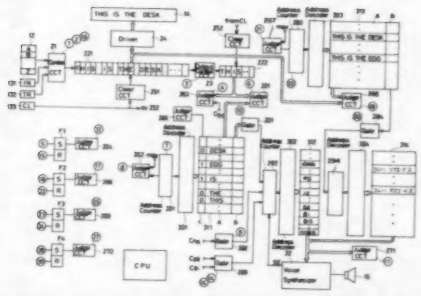
Akira Tanimoto, Kashihara; Tosaku Nakanishi, Nara, and Shigenobu Yanagiuchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 22, 1980, Ser. No. 199,445

Claims priority, application Japan, Oct. 24, 1979, 54-137922; Oct. 25, 1979, 54-138383

Int. Cl.³ G06F *15/38*

U.S. Cl. 364—900 **6 Claims**



1. An electronic translator device wherein first words represented in a first language are entered to obtain second words represented in a second language equivalent to the first words, comprising:

input means for entering the first words;

first memory means for storing a plurality of words represented in the first language;

second memory means for storing a plurality of items of verbal information corresponding to the plurality of words stored in said first memory means;

third memory means for storing a plurality of sentences comprised of words stored in said first memory means;

fourth memory means for storing a plurality of items of verbal information related to translated sentences, represented in the second language, corresponding to the plurality of sentences stored in said third memory means;

translation means responsive to entry of the first words by said input means for addressing said first, third and fourth memory means for translating a first sentence comprised of said first words and stored in said third memory means and for retrieving from said fourth memory means verbal information related to a translated sentence corresponding to said first sentence; and

voice synthesizer means for providing an audible output of said verbal information related to the translated sentence and responsive to entry of each of the first words by the input means for addressing said second memory means for retrieving particular verbal information corresponding to each first word entered and for providing an audible output of each first word entered.

4,393,463

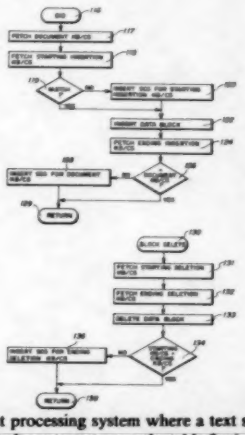
INSERTION OF CHARACTER SET CHANGE CODES IN AN ALTERED TEXT STREAM

John A. Aiken, Jr., Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,784

Int. Cl.³ G06F *7/00*

U.S. Cl. 364—900 **8 Claims**



1. In a text processing system where a text stream is stored and different character sets are selectable for insertion or deletion within the text stream, a method for altering said text stream, comprising the steps of:

displaying said text stream to an operator;

identifying a block of selected text to be inserted or deleted from said text stream at a selected location, said identification in response to operator commands;

determining the character set for the preceding text in said text stream immediately before the selected location and for the following text in said text stream immediately after the selected location;

altering said text stream by inserting or deleting said block of selected text;

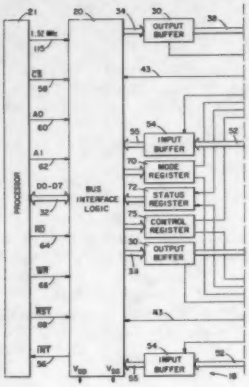
comparing the character set for the preceding text, the following text and the selected text to be inserted or deleted; and

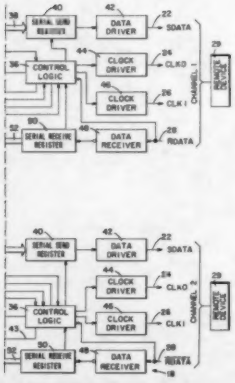
inserting character set change codes in the altered text stream when said comparison indicates a character set mismatch.

4,393,464
CHIP TOPOGRAPHY FOR INTEGRATED CIRCUIT COMMUNICATION CONTROLLER

George W. Knapp, Cambridge, and Bernard B. Spaulding, The Plains, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 12, 1980, Ser. No. 215,975
Int. Cl.[3] G06F *13/00*; H01L *25/00*
U.S. Cl. 364—900 14 Claims





1. An integrated circuit chip for use in a data processing system which includes a processor and a plurality of remote devices in which the processor generates a plurality of first and second control signals for use in transmitting data bits to a remote device, said circuit chip comprising in combination:

a plurality of input and output transmission channels connected to said remote devices over which data bits are transmitted between the processor and the remote device;

first storage means connected to the processor for storing data bits received from the processor;

second storage means for storing the first and second control signals received from the processor for generating third control signals selecting a first or second clock frequency, a fourth control signal selecting the number of data bits to be transmitted and a timing control signal;

means connected to said second storage means for generating a plurality of clock signals at a first or second timing frequency in accordance with the third control signals received from said second storage means;

control means for transmitting the data bits stored in said first storage means and the generated clock signals over said output transmission channels to the remote devices;

said integrated circuit chip having first, second, third and fourth sequentially located edges;

said transmission channels being located adjacent said third edge;

said first storage means being located substantially closer to said third edge than to said first edge;

said signal generating means being located substantially closer to said first edge than to said third edge;

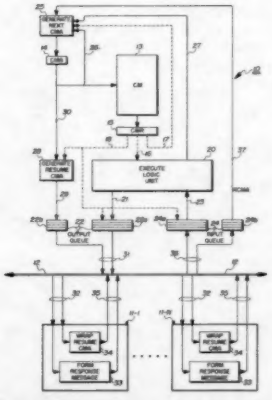
said second storage means being located substantially closer to said second edge than to said fourth edge; and

said control means being located substantially closer to said first edge than to said third edge.

4,393,465
DIGITAL DEVICE FOR TIME-MULTIPLEXING MULTIPLE TASKS

Hanan Potash, La Jolla, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 13, 1981, Ser. No. 253,717
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—900 10 Claims



1. A digital device for time multiplexing the execution of multiple tasks, each of said tasks being defined by a sequence of control words in a control memory in said device, at least one control word in each sequence causing an output message to be sent on output lines in said device, said at least one output message calling for a response message to be received on input lines in said device; wherein the improvement comprises:

means for sending control signals representative of respective resume addresses along with each of said output messages that are sent on said output lines;

means for suspending the execution of each task for which a said resume address is sent and for executing another task in lieu thereof;

means for receiving on said input lines said response messages that are called for by said sent output messages along with said corresponding respective control signals; and

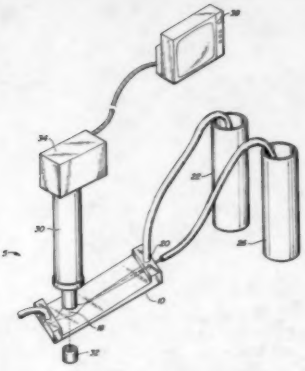
means for resuming the execution of a previously suspended task following the receipt of a response message by executing control words in said control memory beginning at the resume address that is represented by the received control signals.

4,393,466

METHOD OF ANALYZING PARTICLES IN A DILUTE FLUID SAMPLE

Fred H. Deindoerfer, Northridge; Sherman E. DeForest, Encinitas, and Gunner Bolz, Del Mar, all of Calif., assignors to International Remote Imaging Systems, Chatsworth, Calif.

Filed Sep. 12, 1980, Ser. No. 186,418
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—415 **11 Claims**



1. A method of displaying electronically concentrated microscopic particles, from a dilute biological fluid sample containing said particles, comprising:

distributing said fluid sample over an extended area with substantially no particle overlapping other particles;

forming a plurality of optical still images of said sample over said area, with each optical image representing a different portions of said area;

converting each of said optical still images to an electronic image;

compositing the images of the different particles from said electronic images to form one resultant electronic image;

processing the resultant image; and

displaying said processed image,

whereby said processed image is an image of electronically concentrated microscopic particles.

4,393,467

LOCKUP CONTROLLING SYSTEM FOR VARIABLE SPEED, AUTOMATIC TRANSMISSION

Nobuaki Miki; Mutsumi Kawamoto, both of Nagoya; Kazuhiko Shibata, Anjyo; Tsuyoshi Yoshida, Toyota, and Hiroyuki Amano, Chiryu, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of, Japan

Filed Aug. 26, 1980, Ser. No. 181,537
Claims priority, application Japan, Sep. 1, 1979, 54-111927; Sep. 1, 1979, 54-111928; Sep. 1, 1979, 54-111929
Int. Cl.³ G06F *15/20*; B60K *41/08*
U.S. Cl. 364—424.1 **33 Claims**

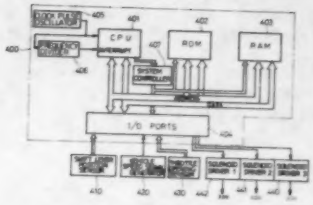
1. A lockup controlling system for an automatic, variable speed transmission including a directly coupled clutch and a hydraulic circuit including a fluid path switching means and solenoid valve means which causes the engagement and disengagement of the directly coupled clutch comprising:

first means for sensing an operating condition of the transmission and for producing a first signal in accordance therewith;

second means for sensing an operating condition of an engine to which the transmission is coupled and for producing a second signal in accordance therewith;

solenoid driver means for selectively energizing or deenergizing the solenoid valve means in response to a solenoid control signal; and

electronic control means including means for storing reference data in the form of one of the operating condition of the transmission and the operating condition of the engine, addressed by the form of the other of the operating condition of the transmission and the operating condition of the engine, and indicative of boundaries between regions where a lockup operation of the transmission is advantageous and regions where the lockup is advantageously terminated, said reference data being provided for a plurality of speed stages; means for reading said first and second signals; means for reading out reference data addressed by one of said first and second signals and comparing the other of said first and second signals with the read-out reference data to provide a solenoid control signal for energizing or deenergizing the solenoid valve means.

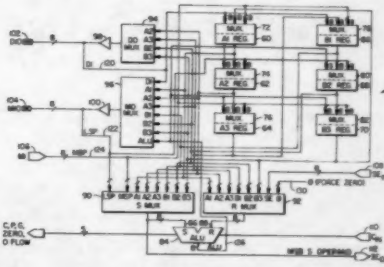


4,393,468

BIT SLICE MICROPROGRAMMABLE PROCESSOR FOR SIGNAL PROCESSING APPLICATIONS

Bernard J. New, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 26, 1981, Ser. No. 247,675
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—736 **11 Claims**



1. An integrated circuit device for processing digital data in response to instruction signals in connection with a digital memory means and multiplier means, said device comprising:

a plurality of storage registers for storing said data;

an arithmetic logic unit for performing preselectable arithmetic and logic operations on said data in response to said instruction signals;

first means for selectively coupling said digital memory means and preselectable ones of said storage registers for moving data between said memory means and said preselected storage registers in response to said instruction signals;

second means for selectively coupling preselectable ones of said storage registers and said arithmetic logic unit to said

multiplier means for moving data from said preselected storage registers and said arithmetic logic unit to said multiplier means in response to said instruction signals;

third means for selectively coupling said multiplier means to preselectable ones of said storage register means and said arithmetic logic unit for moving data from said multiplier means to said preselected storage registers and said arithmetic logic means in response to said instruction signals; and

fourth means for selectively coupling preselectable ones of said storage registers for moving data through said preselected storage registers in response to said instruction signals,

wherein said first, second, third and fourth selective coupling means and said arithmetic logic unit are simultaneously operable in response to said instruction signals.

4,393,469

PROCESS CONTROL APPARATUS

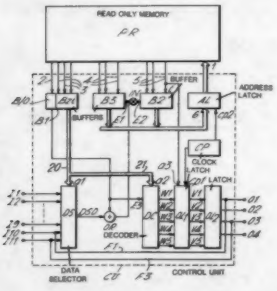
Raymond T. G. Boute, Destelbergen, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 830,505, Sep. 6, 1977, which is a continuation of Ser. No. 670,327, Mar. 25, 1976. This application Oct. 2, 1978, Ser. No. 947,386

Claims priority, application Netherlands, Apr. 1, 1975, 7503820

Int. Cl.³ G06F 9/06

U.S. Cl. 364—900 **5 Claims**



1. A process control apparatus including a memory for storing a program of instructions and a control unit, said control unit including an input circuit having a plurality of inputs for receiving signals representing the condition of said plurality of inputs, said control unit adapted to perform a selected one of said instructions in reading the input condition signal of a selected input to provide a value for a selected one of a plurality of outputs, the output variables each being related to the condition of said inputs of predetermined relationship and said control unit further including an output circuit with a plurality of outputs via which said plurality of output variables can be set and read, wherein said memory comprises storage for a first set of single type instructions, each such instruction correlated with the address of an input to be read and means in said control unit for deriving from the condition of said input read the address of a next following instruction from among at least two instructions of said program.

4,393,470

METHOD AND DEVICE FOR THE COUNTING AND MANAGEMENT OF ASYNCHRONOUS EVENTS EMITTED BY PERIPHERAL DEVICES IN A DATA PROCESSING SYSTEM

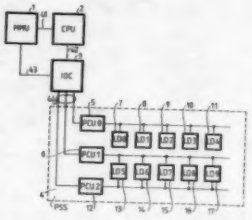
Pierre V. L. Miard, Noisy le Grand, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Nov. 14, 1980, Ser. No. 206,726

Claims priority, application France, Nov. 19, 1979, 79 28422

Int. Cl.³ G06F 3/00

U.S. Cl. 364—200 **18 Claims**



1. A method for managing asynchronous messages emitted by peripheral devices in a data processing system of the type including a central processing system, a plurality of peripheral devices, and a microprogrammed input-output controller for controlling data transfer between the peripheral devices and the central processing system, said method comprising the steps of: signalling to the input-output controller each asynchronous message emitted by a peripheral device; forming in the input-output controller an event message intended for informing the central processing system of the asynchronous message; and accessing a transmitted events counter assigned to the particular peripheral device and comparing the content of this transmitted events counter with the content of a boundary register assigned to the particular peripheral device and containing a limit value; and, if the content of the accessed transmitted events counter is less than the content of the assigned boundary register, then placing the event message in a primary waiting queue where event messages wait for action by the central processing system, and incrementing by one the content of the accessed transmitted events counter; or, if the content of the accessed transmitted events counter is equal to or greater than the content of the assigned boundary register, then placing the event message in a secondary waiting queue where the event message remains so long as the content of the accessed transmitted events counter is equal to or greater than the content of the assigned boundary register.

4,393,471

MEMORY CELL ARRANGEMENT FOR A STATIC MEMORY

Cornelis M. Hart, and Jan Lohstroh, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,816

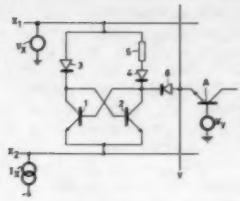
Claims priority, application Netherlands, Nov. 15, 1979, 7908340

Int. Cl.³ G11C 11/40

U.S. Cl. 365—154 **6 Claims**

1. A memory-cell arrangement for a static memory, realized in integrated circuit technology, which is provided with a number of control lines for writing, reading and retaining the memory information in the cell, which cell comprises two cross-coupled transistors which are connected to the control lines, characterized in that the cell is connected to at most three control lines, at least one control line being connected to the collector of the one transistor of the cell via a first diode and to the collector of the other transistor of the cell via the series connection of a resistor and a second diode, said diodes

having an exponential current-voltage characteristic with the expoenent (qV)/(mkT), where q represents the elementary



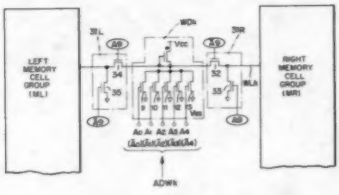
charge, V the voltage, k Boltzmann's constant, T the absolute temperature and m a constant greater than 1.

4,393,472

SEMICONDUCTOR MEMORY CIRCUIT

Hiroshi Shimada, Tokyo, and Keizo Aoyama, Yamato, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1980, Ser. No. 217,803
Claims priority, application Japan, Dec. 27, 1979, 54-169187
Int. Cl.³ G11C 7/00, 11/40
U.S. Cl. 365—190 6 Claims



1. A semiconductor memory circuit comprising:

a right memory cell group and a left memory cell group, each having a plurality of rows and columns corresponding to word lines and bit lines, respectively;

a plurality of word decoders respectively connected to corresponding ones of said rows, said word decoders being connected between the right and left memory cell groups and receiving row address signals specifying a word line within the memory cell group to be selected; and

a plurality of column decoders correspondingly connected to respective ones of said columns for receiving column address signals specifying the bit within the memory cell group to be selected;

a plurality of right memory cell group selection and drive gates operatively connected between respective ones of said word decoders and respective ones of said rows connected to said right memory cell group;

a plurality of left memory cell group selection and drive gates operatively connected between respective ones of said word decoders and respective ones of said rows connected to said left memory cell group; and

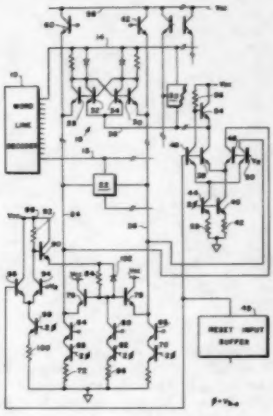
discriminating means for discriminating whether the memory cell to be selected is located in the right or left memory cell group, for providing an output responsive to said discriminating means, and for controlling the right and left memory cell group selection and drive gates in accordance with the output of said discriminating means.

4,393,473

RANDOM ACCESS MEMORY PRESET CIRCUITRY

Roger V. Rufford, Redwood City, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jul. 13, 1981, Ser. No. 282,893
Int. Cl.³ G11C 7/00, 11/40
U.S. Cl. 365—190 6 Claims



1. Circuitry for presetting a bipolar random access memory, said memory including a plurality of memory cells in a matrix of columns and rows, each of said plurality of cells including a bistable flip-flop with each of the inverters of said flip-flop having first and second emitters, the first emitters of all memory cells in each row of said matrix being coupled together and to a bottom word line terminating in a first grounded current source, the second emitters of all memory cells in each column being coupled to one of a plurality of bit line pairs, each bit line inset pairs being terminated in a second grounded current source, each of said bit line pairs being coupled to a bit line clamping circuit, said memory presetting circuitry comprising:

reset signal input circuitry for producing a high output signal during operation of said memory and a low output signal for presetting said memory;

first circuit means interposed between each bottom word line and its respective first grounded current source, and responsive to said low output signal for breaking the circuit between said word line and its current source and for applying V_{cc} to each of said word lines;

second circuit means coupled between each bit line clamping circuit and its respective power source, said second circuit means responsive to said low output signal for disabling said clamping circuit;

third circuit means coupled to each bit line in each pair of said plurality of bit line pairs, said third circuit means responsive to said low output signal for drawing current from said bit line; and

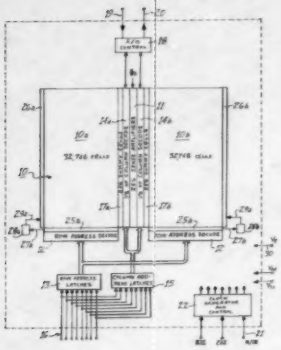
read/write control means interposed between each bit line and a positive voltage source for selectively applying said positive voltage to one bit line in each of said pairs.

4,393,474

EPROM AND RAM CELL LAYOUT WITH EQUAL PITCH FOR USE IN FAULT TOLERANT MEMORY DEVICE OR THE LIKE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 88,709, Oct. 26, 1979. This application Feb. 11, 1980, Ser. No. 120,429
Int. Cl.³ G11C 11/40
U.S. Cl. 365—200 12 Claims



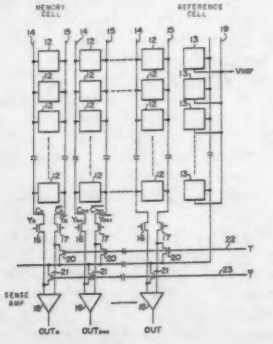
1. A fault tolerant semiconductor memory device formed in a face of a semiconductor body comprising: a data memory array at said face composed of rows and columns of read/write memory cells, and a plurality programmable cells laid out at said face in rows of the same pitch as and aligned with said rows of the data memory array, each of the programmable cells being individually programmed to retain indefinitely an indication of a faulty cell present in the aligned row of memory cells, and at least one row of redundant cells for replacing one of said rows of memory cells containing a faulty cell in response to the programmable cell for such row being programmed.

4,393,475

NON-VOLATILE SEMICONDUCTOR MEMORY AND THE TESTING METHOD FOR THE SAME

Norihisa Kitagawa, and Eisaburo Iwamoto, both of Tokyo, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 27, 1981, Ser. No. 229,027
Int. Cl.³ G11C 11/40
U.S. Cl. 365—201 3 Claims



1. A system for determining the storage capability of each cell in a nonvolatile semiconductor memory device formed of an array of rows and columns of memory cells comprising:

one or more reference memory cells;

a reference voltage supply connected to said reference memory cells, wherein said reference voltage is greater than the threshold voltage and less than the storage voltage of said memory cells;

a plurality of differential sense amplifiers;

means for selectively coupling each column of memory cells to one input of a corresponding one of said plurality of differential sense amplifiers; and

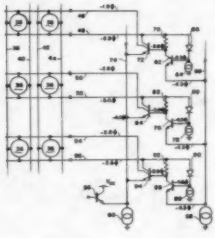
means for selectively coupling one or more of said reference memory cells to the other input of each of said plurality of differential sense amplifiers, wherein the output of the selected differential sense amplifier is related to the storage capability of a selected memory cell.

4,393,476

RANDOM ACCESS MEMORY DUAL WORD LINE RECOVERY CIRCUITRY

Warren R. Ong, Cupertino, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jul. 13, 1981, Ser. No. 282,767
Int. Cl.³ G11C 11/40
U.S. Cl. 365—203 7 Claims



1. Discharge circuitry for rapidly discharging each of a plurality of electrical conductors when the voltage thereon drops from a first selected voltage level through a mid-state transition toward a second voltage level, said circuitry comprising:

a plurality of first transistors each coupled in series with a resistance element being one of said plurality of conductors and a first current source conductor common to the emitters of all of said first transistors;

control circuitry coupled to the base of each of said plurality of first transistors and to its respective electrical conductor, said control circuitry applying to said base a voltage of one V_{be} below the voltage on said respective conductor, the particular first transistor of said plurality that receives the highest base voltage from its control circuitry establishing the voltage level on said first current source conductor and the emitter of each of said plurality of first transistors;

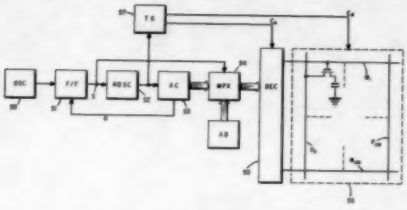
a plurality of second transistors each coupled between one of said plurality of conductors and a second current source conductor common to the emitters of all of said second transistors, the base of each of said second transistors being coupled to the collector of a corresponding one of said first transistors, the particular second transistor of said plurality that receives the highest base voltage establishing the voltage level on said second current source conductor and the emitters of each of said plurality of second transistors.

4,393,477

TEMPERATURE RESPONSIVE REFRESH CONTROL CIRCUIT

Tatsunori Murotani, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1980, Ser. No. 215,465
Claims priority, application Japan, Dec. 11, 1979, 54-160554
Int. Cl.³ G11C 7/00; H03K 3/282
U.S. Cl. 365—222 6 Claims



1. A memory circuit comprising a memory cell array including a plurality of memory cells, each of said memory cells storing data in a dynamic manner; an oscillator for generating an oscillation signal having a frequency characteristic with a positive temperature coefficient, said oscillator including a first terminal receiving a first potential, a second terminal receiving a second potential, an output terminal from which said oscillation signal is derived, first to third nodes, a first resistor made of polycrystalline silicon and coupled between said first terminal and said first node, a second resistor made of polycrystalline silicon and coupled between said first terminal and said second node, a first capacitor coupled between said first node and said second terminal, a second capacitor coupled between said second node and said second terminal, a first field effect transistor coupled beteen said first node and said second terminal and having a gate coupled to said third node, a second field effect transistor coupled between said second node and said second terminal and having a gate coupled to said first node, a third field effect transistor coupled between said third node and said second terminal and having a gate coupled to said second node, a fourth field effect transistor coupled between said first terminal and said third node, a third capacitor coupled between said third node and a gate of said fourth transistor, a fifth field effect transistor coupled between said first terminal and the gate of said fourth transistor and having a gate coupled to said first terminal, and means for connecting said third node to said output terminal; and refresh means responsive to said oscillation signal for operatively refreshing at least one of said memory cells.

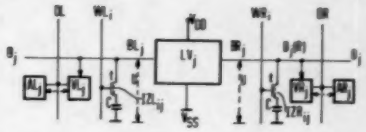
4,393,478

MONOLITHICALLY INTEGRATED SEMICONDUCTOR MEMORY WITH DUMMY AND CHARGE EQUALIZATION CELLS

Dieter Kantz, Munich, and Eugen Seher, Grafenau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,344
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029108
Int. Cl.³ G11C 7/00, 7/06
U.S. Cl. 365—210 6 Claims

1. Monolithically integrated semiconductor memory having a matrix formed of identical information storage cells arranged in rows and columns in the form of single-transistor storage cells, a respective comparator and a dummy cell, likewise provided by a single-transistor storage cell, being operatively associated either with each matrix column or each matrix row, comprising a respective second single-transistor storage cell provided as a charge equalization cell and identical, at least with respect to storage capacity with the dummy cell and operatively associated with each of the dummy cells, each of said charge equalization cells respectively having a drive balanced relative to the drive of the dummy cell operatively associated therewith so that, in a first phase triggered by the respective dummy cell having been addressed by an addressing signal, the dummy cell storage capacity is charged and the charging state of the storage capacity of the respective charge equalization cell is set so that the charging state in said charge equalization cell corresponds to the signal inverse to said addressing signal effecting the charging of the dummy cell, so that, in a second operating phase, the storage capacity of the dummy cell and the storage capacity of said charge equalization cell are connected in parallel for charge equalization, and so that, in a third operating phase, the respective storage capacities of the dummy cell and said charge equalization cell are again separated by driving the comparator from the dummy cell.

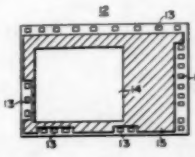


4,393,479

METHOD FOR ERASING DATA OF A NON-VOLATILE SEMICONDUCTOR MEMORY INTEGRATED CIRCUIT

Nguyen T. Du, Hatogaya, and Akihide Asao, Ohita, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 17, 1980, Ser. No. 207,179
Int. Cl.³ G11C 13/00
U.S. Cl. 365—218 3 Claims



1. A method for erasing data of a floating-gate non-volatile semiconductor memory integrated circuit comprising the steps of writing data into memory cells of said memory integrated circuit by selectively charging the floating gates thereof and erasing such data by irradiating an X-ray beam at a wavelength of 0.23 to 10 A to a dosage of approximately 10^4 to 10^6 Rads to said memory cells through a plastic package.

4,393,480

ADDRESS BUFFER CIRCUIT

Hiroshi Shimada, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 13, 1981, Ser. No. 234,197
Claims priority, application Japan, Feb. 16, 1980, 55-18018
Int. Cl.³ G11C 11/40
U.S. Cl. 365—227 13 Claims

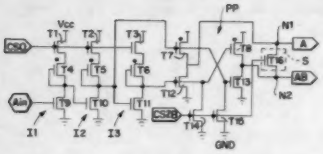
1. An address buffer circuit, having an active period which has high and low levels and having a standby period, which generates a pair of complementary output signals corresponding to an address input signal, comprising:

buffer circuit means for buffering the address input signal;

means, operatively connected to said buffer circuit means, for suspending power consumption by said address buffer

circuit when in the stand-by period responsive to an external signal;

output means, operatively connected to said buffer circuit means, having a par of output terminals for outputting said pair of complementary output signals; and



short circuit means, operatively connected between said pair of output terminals of said output means, for forcing the potential of said pair of output terminals to a same potential between the high and low levels of said address buffer circuit in the active period by electrically connecting said pair of output terminals in said stand-by period.

4,393,481

NONVOLATILE STATIC RANDOM ACCESS MEMORY SYSTEM

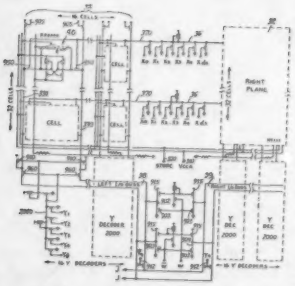
William H. Owen, Mountain View; Richard T. Simko, Los Altos, and Wallace E. Tchon, Sunnyvale, all of Calif., assignors to Xicor, Inc., Milpitas, Calif.

Continuation of Ser. No. 71,499, Aug. 31, 1979, Pat. No. 4,263,644. This application Nov. 21, 1980, Ser. No. 209,131

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—228 **10 Claims**



1. A nonvolatile electrically-alterable integrated circuit memory device comprising:

means for receiving a low level power supply for powering said device;

memory array means comprising a plurality of volatile memory cells for storing of data in binary form and a plurality of nonvolatile memory cells for nonvolatile storing of data in binary form;

store means responsive to a store command signal for copying the present data state of each said volatile memory cell into a corresponding said nonvolatile memory cell, said store means including high voltage generator means responsive to said store command signal for utilizing said low level power supply for generating a high voltage pulse signal and for coupling said pulse signal to each said nonvolatile memory cell, thereby effecting said copying of data; and

recall means responsive to a recall command signal for copying data in at least one of said nonvolatile memory cells to its corresponding said volatile cell.

4,393,482

SHIFT REGISTER

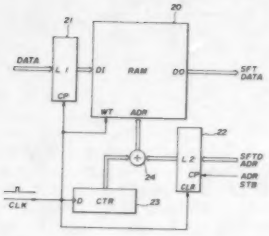
Kunihiro Yamada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1980, Ser. No. 204,923

Claims priority, application Japan, Nov. 8, 1979, 54-144838; Nov. 8, 1979, 54-144839

Int. Cl.³ G11C *8/00*

U.S. Cl. 365—236 **5 Claims**



1. A shift register of the type capable of performing shift operations by changing the access of a random access memory comprising:

a random access memory having a memory capacity of 2^k words,

where $2^k \geqq n$ and n is the number of steps required for said shift register;

a k-bit counter adapted to perform a counting operation when a clock pulse is input thereof an then to input, via a k-bit operation unit, the count output to said random access memory as an address for writing an input data in said random access memory; and wherein

said k-bit operation unit is adapted to perform an operation with respect to said count output of said k-bit counter and the address of desired shifted data and then to output the operated result as an address for reading said shifted data from said random access memory, whereby high speed reading operation of said shifted data is attained.

4,393,483

TEST SET FOR A DIRECTIONAL COMMAND ACTIVE SONOBUOY SYSTEM (DICASS)

David C. Hammond, Hatboro; Stephen M. Elchenko, Pipersville; John M. Tralies, Norristown; Peter W. Verburgt, Perkasie, and Leon R. Robinson, Morrisville, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 291,000

Int. Cl.³ H04B *17/00*

U.S. Cl. 367—13 **1 Claim**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 100 Pages)

1. An apparatus for testing an active target-detecting sonobuoy system comprising:

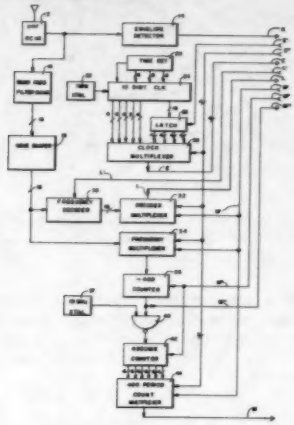
downlink means for categorizing the modulation of a first radio frequency carrier signal thereby producing digital data indicative of the frequency and pulse width of the modulation;

uplink means coupled to said downlink means for generating a second radio frequency carrier signal modulated by simulated target and environmental information;

controller means interconnected between said downlink and uplink means and containing a stored program for automatically analyzing said digital data to validate frequency and pulse width of the modulation in accordance with

specified parameters and for producing an output signal indicative of the analysis results;

peripheral input means connected to said controller means for providing instructional information related to operational parameters of the system; and



peripheral output means connected to said controller means for displaying instructional information related to the operation of the system and the output signal of said controller means.

4,393,484

METHOD OF STACKING SEISMIC DATA

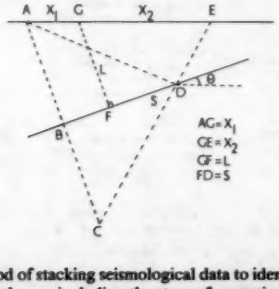
David J. Buchanan, Burton-on-Trent; Richard Davis, Ashby-de-la-Zouch, and Peter J. Jackson, Boundary, Nr. Burton-on-Trent, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 2, 1980, Ser. No. 193,321

Claims priority, application United Kingdom, Oct. 19, 1979, 7936413

Int. Cl.³ G01V *1/36, 1/20*

U.S. Cl. 367—23 **7 Claims**



1. A method of stacking seismological data to identify a fault in a geological seam including the steps of arranging shots and detectors in a seam or the surrounding strata, firing the shots sequentially and detecting any reflections thereof with the detectors, and selecting from the seismic traces those having a common reflection point, wherein a target is divided into a number of equal length segments and each trace is assigned to the segment which contains the point at which reflections would occur, traces belonging to the same line segment being stacked after applying a move out correction according to the formula:

$$P^2 = x_1^2 + x_2^2 + 2x_1x_2 \operatorname{Cos} 2\theta + 4L^2 + 4L(x_1 - x_2) \operatorname{Sin} \theta$$

in which P is the distance travelled by seismic signal emanating at a shot, reflecting at a point on a reflector where specular reflection occurs, and being received at a detector;

θ is the angle between shot-detector line and the reflector;

L is the length of a line extending perpendicularly from the reflector to a point of origin on the shot-detector line;

x_1 is the distance between the shot and the point of origin;

x_2 is the distance between the detector and the point of origin.

4,393,485

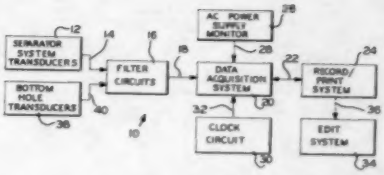
APPARATUS FOR COMPILING AND MONITORING SUBTERRANEAN WELL-TEST DATA

Raymond L. Redden, Sacramento, Calif., assignor to Baker International Corporation, Orange, Calif.

Filed May 2, 1980, Ser. No. 146,734

Int. Cl.³ G01V *1/40, 1/22*

U.S. Cl. 367—25 **28 Claims**



1. An apparatus for compiling and monitoring data during the testing of a subterranean well having a plurality of transducers for generating signals representing production characteristics of the well, including at least one transducer positioned at the surface of the well for generating a surface production characteristic signal representing at least one of wellhead pressure, wellhead temperature, gas temperature, oil temperature, gas differential pressure, static separator pressure, oil flow and water flow, comprising: means connected to the transducers for periodically storing values of the transducer signals; means connected to said means for storing for reading said stored value of said one surface transducer signal to generate a value for an additional operating characteristic of the well; means connected to said means for storing and said means for generating said additional operating characteristic value for generating a plurality of output signals representing said stored values and said additional operating characteristic value; a power supply connected to power the transducers; means connected to said power supply for generating a voltage level signal representing the magnitude of the power supply output voltage; and means for comparing said voltage level signal with predetermined upper and lower voltage limits to generate a power fluctuation signal when said voltage level signal is outside said voltage limits.

4,393,486

METHOD FOR INTERPRETING WELL LOG RECORDS TO YIELD INDICATIONS OF GAS/OIL IN AN EARTH FORMATION SUCH AS A SANDSTONE, LIMESTONE, OR DOLOSTONE

Don D. Thompson, Corona Del Mar; Robert J. S. Brown, Fullerton, and Richard J. Runge, Anaheim, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 82,382, Oct. 5, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,702

Int. Cl.³ G01V *1/36, 1/30*

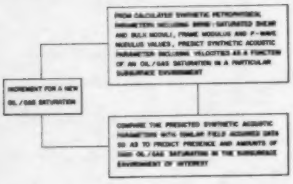
U.S. Cl. 367—73 **12 Claims**

1. Method for resolving events of an acoustic log of a first

well associated with at least a selected zone of an earth formation so as to determine gas/oil fractions therein by creating synthetic gas/oil-indicating characteristics from brine-saturated petrophysical parameters corresponding to said selected zone of interest at a second well, including P-wave velocity, bulk density and porosity, with or without mineralogical inputs, as a function of gas/oil saturation, temperature and pressure (depth), but without shear-wave velocity inputs, comprising the steps of:

(a) selecting a lithology for said second well at said selected zone of interest from a group comprising sandstone, limestone and dolostone:

(b) from brine-saturated bulk and shear moduli (Kw* and Gw*) calculated from empirical equations including true brine-satuated P-wave values (Pw*) of a sample which corresponds to said zone of interest based on well logging or geologic data, and estimated frame modulus values (Ka) of said zone of interest, predicting a plurality of bulk moduli (K*) with gas/oil present in said zone of interest in preselected amounts:



(c) predicting a multiplicity of P-wave moduli of said zone with gas/oil present (Pgas/oil*) in said preselected amounts based on the relationship

$$P_{gas/oil^*} = K_{gas/oil^*} + (4/3)G_{w^*}$$

where Pgas/oil* is a multiplicity of predicted P-wave moduli with gas/oil present in said preselected amounts; Kgas/oil* is a plurality of predicted bulk moduli of said zone with gas/oil present in said preselected amounts; Gw* is the brine-saturated shear modulus of said zone;

(d) predicting from acoustic velocities within said zone calculated from step (c) as a function of different gas/oil gravities and saturations, synthetic acoustic values based on a relationship involving variation of said values as a function of different gas/oil gravities and saturations; and

(e) comparing said synthetic values indexed to different gas/oil gravities and/or saturations with actual field-produced values produced from said acoustic log to predict amounts of gas/oil in said zone of interest.

4,393,487

STYLUS CARTRIDGE

Paul J. Straub, Jr., Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,550
Int. Cl.³ G11B *3/58*
U.S. Cl. 369—74 **10 Claims**

5. A stylus cartridge comprising:

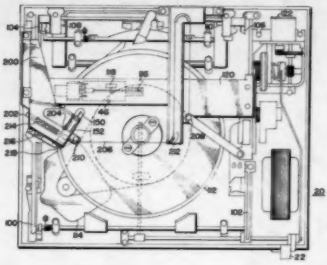
(A) a stylus;

(B) a stylus arm having said stylus disposed at one end thereof;

(C) a cartridge housing; said cartridge housing being provided with a pair of guide rails;

(D) means for flexibly supporting the other end of said stylus arm in said cartridge housing;

(E) a pair of oppositely-disposed, integrally-molded flexural retaining fingers for supporting said stylus arm in a raised position within the confines of said cartridge housing; each of said retaining fingers being equipped with a depending portion having a slanting surface; said slanting surfaces serving to center said stylus arm within said cartridge housing; and



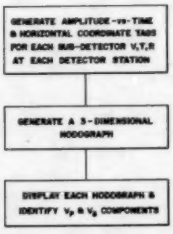
(F) an actuating member slidably mounted on said cartridge guide rails; said actuating member being equipped with a wedge-shaped portion which engages said retaining fingers to spread them apart when said actuating member is advanced.

4,393,488

EXPLORATION SYSTEM AND METHOD OF DETERMINING ELASTIC PARAMETERS AND SUBSURFACE SHAPE OF AN EARTH FORMATION SO AS TO INDICATE LIKELIHOOD OF THE FORMATION BEING AN ORE, MARKER ROCK, ECONOMIC MINERAL OR THE LIKE

Gary S. Gassaway; Henry J. Richgels, both of San Rafael, and James I. Foster, Novato, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 952,887, Oct. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 238,503, Feb. 26, 1981, abandoned. This application Aug. 8, 1980, Ser. No. 176,607
Int. Cl.³ G01V *1/30*
U.S. Cl. 367—75 **8 Claims**


GENERATE AMPLITUDE-vs-TIME & HORIZONTAL COORDINATE TAGS FOR EACH SUB-DETECTOR V,T,R AT EACH DETECTOR STATION
GENERATE A 3-DIMENSIONAL HODOGRAPH
DISPLAY EACH HODOGRAPH & IDENTIFY V_p & V_s COMPONENTS

1. Method of accurately determining shape and elastic parameters of an earth formation to identify ore, marker rocks, economic minerals or the like, using a refraction exploration field system including a series of detectors, positioned along a line or survey at inline positions $X_1, X_2, \ldots X_n$ and at least one seismic source located adjacent to said detectors for producing a seismic wave for travel through said formation:

(a) generating a seismic wave at a first sourcepoint location adjacent said series of detectors;

(b) after said wave undergoes refraction, detecting arrival of a refracted wave at said series of detectors at said inline offset positions, to obtain a first set of traces associated with said offset positions $X_1, X_2, \ldots X_n$;

(c) repeating steps (a) and (b) by generating a second wave at a second sourcepoint adjacent to inline position X_n of

said detector positions, and detecting said refracted wave to obtain a second set of traces;

(d) advancing said series of detectors a selected number of inline positions or fractions thereof and repeating steps (a), (b) and (c) above to obtain additional sets of traces, but in which said additional sets of traces are associated with more than two inline positions overlapping common inline positions of said first and second sets of traces;

(e) distinguishing arrival times of shear waves from compressional waves by means of a three-dimensional isometric hodograph generated by a computer-dominated process; and

(f) depicting representations of arrival times of at least one segment of (i) shear waves and (ii) compressional waves as a function of inline position whereby shape of said earth formation as well as elastic parameters indicative of likelihood of said formation being an ore, marker rock, economic mineral, and the like, are provided.

4,393,489

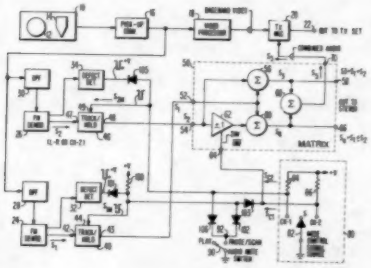
AUDIO PROCESSOR FOR SINGLE, CHANNEL, MATRIXED TWO-CHANNEL AND UN-MATRIXED TWO-CHANNEL SIGNALS

Gopi N. Mehrotra, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 30, 1981, Ser. No. 248,776

Int. Cl.³ G11B *3/74, 27/36;* **H04N** *5/76;* **H04H** *5/00*

U.S. Cl. 369—86 **6 Claims**



1. Apparatus for processing an audio FM input signal conveying audio information in single-channel, matrixed two-channel or un-matrixed two-channel form, comprising:

signal processing means including first and second FM demodulator means having input means for receiving said audio FM input signal and output means for providing respective first and second audio signals, S1 and S2, and having first and second defect detector means coupled to respective ones of said demodulator means for providing respective first and second audio defect indicating signals;

audio matrix means for receiving said audio signals and being responsive to a first condition of a first control signal supplied thereto for assuming a first operating mode for producing at a first output terminal a first output signal S3 proportional to the sum of said audio signals and for producing at a second output terminal a second output signal, S4, proportional to the difference of said audio signals, said audio matrix means being responsive to a second condition of said first control signal for assuming a second operating mode wherein each of said first and second output signals at said first and second output terminals is proportional to said sum of said audio signals;

audio muting means for coupling said first and second audio signals to said audio matrix means and being responsive to first and second muting signals supplied thereto for muting respective ones of said first and second audio signals;

control means for producing said first control signal and a second control signal, said control signals being representative of selected processing modes of said apparatus, said control means being coupled to apply said first control signal to said matrix means for controlling the operating mode thereof; and

logic means for combining said first control signal and said first defect indicating signal to form said muting signal and for combining said second control signal and said second defect indicating signal to form said second muting signal.

4,393,490

DIGITAL TELECOMMUNICATIONS SWITCHES NETWORK WITH IN-BUILT FAULT IDENTIFICATION

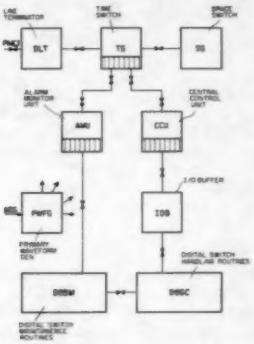
Ernest Culley, Broadstone, England, assignor to The Plessey Company plc, Ilford, England and The Plessey Company plc, Ilford, England

Filed Aug. 7, 1980, Ser. No. 176,136

Claims priority, application United Kingdom, Aug. 10, 1979, 7927857

Int. Cl.³ H04J *3/14;* **H04Q** *11/04*

U.S. Cl. 370—13 **3 Claims**



1. A telecommunications exchange switching network including time and space switching stages in which each time and space switching stage includes connection control stores arranged to be cyclically read in cross-office slot order to provide the speech path connection information for each cross-office slot and each control store includes checking means arranged to check the authenticity of the connection specified by the control store at each cross-office slot and each switching stage includes fault pattern injection means arranged to be activated, in the event that said checking means detects an error, to inject a characteristic pattern, which is a corrupted speech sample and is indicative of the identity of the switching store, into the speech path defined by the connection control store in a particular slot.

4,393,491

AUTOMATIC SELF-TEST SYSTEM FOR A DIGITAL MULTIPLEXED TELECOMMUNICATION SYSTEM

Robert L. Ashlock, Diamond Bar; Carl E. Gabrielson, Santa Ana; Douglas P. Kerr, Irvine; David J. Rasmussen, Riverside; Theodore M. Stump, Costa Mesa, and Charles W. Thode, Tustin, all of Calif., assignors to Anaconda-Ericsson, Greenwhich, Conn.

Filed Nov. 5, 1980, Ser. No. 204,300

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—13 **34 Claims**

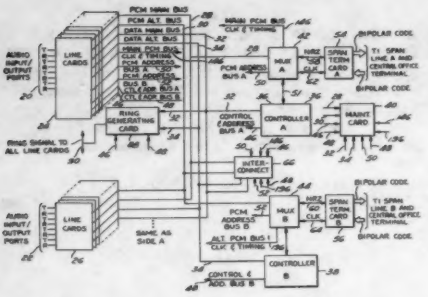
1. A maintenance circuit for a digital multiplexed communication system having a central office terminal and a remote terminal with a plurality of digital-to-analog and analog-to-digital line card interface circuits including audio line drivers and receivers for individual telephone lines, said maintenance

circuit located in said remote terminal to automatically test said line card interface circuits whenever they are idle, comprising:

a data bus coupled to said line card interface circuits for carrying digital data;

a generator means coupled to said data bus for generating a plurality of words of digital test data;

a detector means coupled to said data bus for detecting test data and for generating an output signal; and



means to automatically, continuously determine which said line card interface circuits are idle and for causing said generator means to send said digital test data to said idle line card interface circuits and for causing said detector means to be coupled to said idle line card interface circuits to detect the presence of digital test data after it has been converted to analog form and then back to digital form by said idle line card interface circuits.

4,393,492

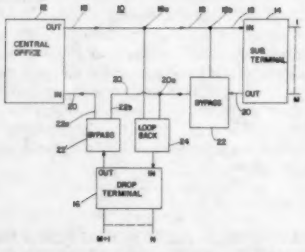
DIGITAL SUBSCRIBER CARRIER SYSTEM INCLUDING DROP TERMINALS AND BYPASS AND LOOPBACK MEANS AND ALARM INDICATION MEANS

Larry D. Bishop, Colleyville, Tex., assignor to Reliance Electric Co., Cleveland, Ohio

Filed Feb. 17, 1981, Ser. No. 234,797

Int. Cl.[3] H04J *3/08, 3/14*

U.S. Cl. 370—15 **29 Claims**



27. In an N channel digital subscriber carrier system having a central office and at least one remote terminal for serving at least one of said subscribers connected thereto by a transmission medium and in which information signals are transmitted on said medium in a first predetermined format which is divided into a predetermined repetitive number of frames each of which is divided into N channels each having a predetermined number of bits, each of said N channels being associated with a respective one of said subscribers, an alarm system comprising:

(a) central office alarm means including:

(i) means for identifying when said signal is in a second predetermined format which is related to said first predetermined format a regularly recurring bit in a predetermined one of said frames for at least said channel associated with said at least one subscriber and inserting therein a preselected value; and

(ii) means responsive to said information signal when said signal is in said second format with said preselected bit value for transmitting said signal in said first format in serial fashion on said medium;

(b) remote terminal alarm means including:

(i) means responsive to said signal in said medium for converting said signal to said second format;

(ii) conditioning means having an output responsive to said signal in said second format for changing said value in said regularly recurring bit to a value opposite to said value inserted in said central office alarm means said means operating not to change said value upon the occurrence of at least one of a predetermined fault condition in said system; and

(iii) means connected to said conditioning means output for transmitting said signal in said first format in serial fashion; and

(c) means included in said central office means responsive to said signal in said first format received from said medium for converting said signal to said second format and in response thereto for comparing the value of said received bit to the value of said second format transmitted bit and for generating an alarm signal when said values are the same.

4,393,493

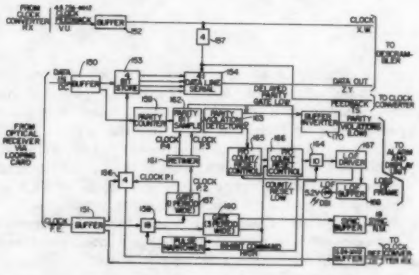
AUTOMATIC PROTECTION APPARATUS FOR SPAN LINES EMPLOYED IN HIGH SPEED DIGITAL SYSTEMS

Allan K. Edwards, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,133

Int. Cl.[3] H04J *3/12, 3/14*

U.S. Cl. 370—16 **24 Claims**



22. A method of providing a control code for use in communicating control information from a near end telecommunication location to a far end location which locations are in communication via a digital transmission line, carrying digital data, encompassing a plurality of sequential data frames each having a predetermined number of binary bits, with at least one bit in each frame indicative of a parity bit for conventionally determining whether ones of said data bits in said frame are even in number or odd in number, comprising the steps of:

intentionally modifying said parity bit in successive frames to provide cyclical codes each code manifesting a separate control status;

responding to said parity bit as modified to provide said code to enable performing a control function as specified by said code.

4,393,494

TRANSCEIVER FOR FULL-DUPLEX TRANSMISSION OF DIGITAL SIGNALS OVER A COMMON LINE

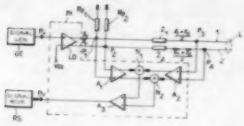
Piero Belforte, Turin, and Renzo Bortignon, Borgaro Torinese, both of Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Oct. 2, 1980, Ser. No. 193,009

Claims priority, application Italy, Oct. 4, 1979, 68914 A/79

Int. Cl.³ H04B *1/56;* H04L *5/14*

U.S. Cl. 370—27 7 Claims



1. A transceiver inserted between a signal source and a line with at least one ungrounded conductor designed for two-way transmission of digital signals, said conductor being provided with a terminating impedance having a proximal end and a distal end as seen from said signal source, comprising:

a first pair of emitter-coupled twin transistors with respective first bases, with an inverting and a noninverting first output connected to respective first collectors thereof and with a first input circuit including a connection from one of said first bases to said conductor at said proximal end for picking up an outgoing signal originating at said signal source;

a second pair of emitter-coupled twin transistors with respective second bases, with an inverting and a noninverting second output connected to respective second collectors thereof and with a second input circuit including a connection from one of said second bases to said conductor at said distal end for picking up a mixture of said outgoing signal with an incoming signal, said first inverting output being directly connected to said second noninverting output at a first junction, said first noninverting output being directly connected to said second inverting output at a second junction, said first and second pairs having a gain ratio substantially suppressing said outgoing signal at said junctions; and

a differential amplifier with inputs respectively connected to said junctions and with an output connected to a signal receiver.

4,393,495

MESSAGE TRANSLATION ARRANGEMENT FOR TELEPHONY SYSTEM WITH ROMOTE PORT GROUPS

Edgar R. Cray, Altamonte Springs; Russell R. Davis, Seminole County; Maynard K. Knapp, Altamonte Springs; Glenn L. Richards; Bernard H. Root, both of Longwood, and William W. Woodruff, Winter Springs, all of Fla., assignors to Stromberg-Carlson Corporation, Tampa, Fla.

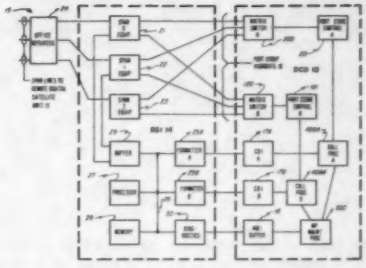
Filed Nov. 5, 1980, Ser. No. 204,114

Int. Cl.³ H04J *3/12;* H04Q *3/54*

U.S. Cl. 370—56 38 Claims

1. In a telephony system for selectively interconnecting telephone calls among a plurality of telephone lines that includes, at a first location, a plurality of port group highway means for receiving and transmitting signals that represent voice data and signals in a first format that represent supervisory data, and call processing means including a digital data processor and an input/output bus means for selectively interconnecting the plurality of port group highway means in response to certain of a plurality of commands interpreted by the digital data processor, said telephony system including, at a second location that is physically remote from the first location, port means for transmitting onto and receiving from certain of the telephone lines first port signals representing voice data and for transmitting and receiving second port signals representing voice data signals and supervisory data signals, the telephony system further comprising communications linkage means connected to the port means for conveying the second port signals in a predetermined format, the improvement of interfacing means comprising:

A. encoding means connected to the input/output bus means for encoding signals representing supervisory data signals in response to commands from the call processing means,



B. transfer means connected to a selected port group highway means, the communications linkage means and said encoding means for converting signals between the format of the signals at the port group highway means and said encoding means and the format of the signals on the communications linkage means, and

C. message generating means connected to said transfer means and to the input/output bus means for transmitting messages to the call processing means in response to certain signals representing supervisory data signals received in said transfer means from the communications linkage means.

4,393,496

METHOD FOR FEEDING CALL PROGRESS TONES INTO CONFERENCE CONNECTIONS

Rolf Zeiträg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,676

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005162

Int. Cl.³ H04M *3/56*

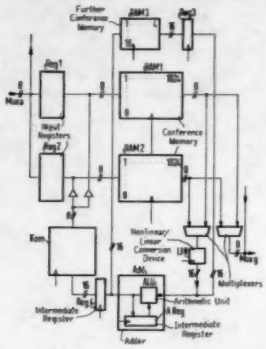
U.S. Cl. 370—62 1 Claim

1. In a method for feeding call progress tones into conference connections in a pulse code modulation (PCM) time-division multiplex switching system, in which PCM code words are repetitively supplied by conference subscribers, sum code words are formed from the PCM code words and said PCM code words are intermediately stored in one half of a first conference memory, in which a plurality of different partial sum code words are formed by subtracting from a sum code word a respective different one of the supplied PCM code words, said partial sum code words being intermediately stored in a second conference memory before transmission of those partial sum code words to each subscriber, such partial sum code word containing only the code words supplied by the other conference subscribers, and in which the above steps are performed for subsequently-arriving PCM words with respect to a second half of the first conference memory and the conference memory halves alternately so perform the above steps at each new receipt of PCM code words, the improvement comprising the steps of:

in addition to forming the sum code words, forming call

progress tone sum code words, by adding code words stored in the memory halves to respective call progress tone code words;

intermediately storing the sum code words and respective call progress tone sum code words; and



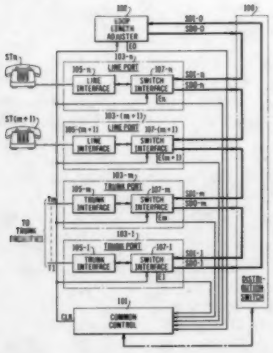
selectively forming partial sum code words by subtracting a PCM code word pertaining to a particular subscriber from either the intermediately stored sum code words or the respective call progress tone sum code words on the basis of call progress criteria.

4,393,497

LOOP SWITCHING SYSTEM

Richard F. Cantwell, Jr., Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 20, 1981, Ser. No. 255,469
Int. Cl.³ H04J *3/08;* H04Q *11/04*
U.S. Cl. 370—89 **15 Claims**



1. A communication system for serially interconnecting n communication circuits (T1–Tm, ST(n−m)–Stn) comprising:

n port means (**103-1** to **103-*n***), each having an input (SDI-i) and an output terminal (SDO-i), associated on a one-to-one basis with said n communication circuits (T1–Tm, ST(n−m)–STn) for interfacing said n communication circuits (T1–Tn, ST(n−m)–STn) to said communication system;

control means (**101**) for establishing an order of interconnection for all of said n port means; and

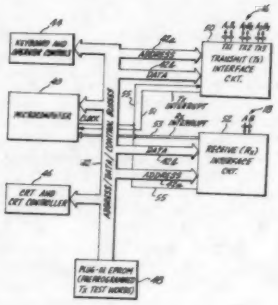
interconnection means (**100**) connected to said input (SDI-i) and said output (SDO-i) terminals of all of said n port means (**103-1** to **103-*n***) and responsive to said control means (**101**) for carrying data messages from said output terminal (SDO-(m+1)) of the (m+1)th port means (**103-(*m*+1)**) to said input terminal (SDI-m) of the m th port means (**103-*m***) for all n said port means (**103-1** to **103-*n***) according to said order of interconnection.

4,393,498

METHOD AND APPARATUS FOR TESTING SYSTEMS THAT COMMUNICATE OVER DIGITAL BUSES BY TRANSMITTING AND RECEIVING SIGNALS IN THE FORM OF STANDARDIZED MULTI-BIT BINARY ENCODED WORDS

Tee-Squant-Nee Jackson, Seattle; Paul M. Vernon, Redmond, and David A. Schoen, Bothell, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 22, 1981, Ser. No. 227,371
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—20 **8 Claims**



1. A test apparatus for testing systems that communicate by transmission and/or reception of transmit and/or receive words, respectively, in which such words are organized in a predetermined multiple bit format, comprising:

computer means including a memory;

data entry means for entering into the memory of said computer means the content of a first multi-bit transmit word in either engineering notation or in binary encoded notation;

said computer means further including engineering to binary conversion processing means for accepting and converting the content of a transmit word in said memory when entered in said engineering notation, into said binary encoded notation;

a first transmit port;

transmit circuit means responsive to said computer means for formatting and transmitting said first transmit word in binary notation from said first transmit port;

receiving circuit means for receiving a multiple bit receive word in binary notation, said receiving circuit means including means responsive to said computer means for receiving and storing said receive word in binary notation in said memory of said computer means;

said computer means further having binary to engineering conversion processing means for converting the context of said first transmit word to engineering notation when entered into said memory in binary notation, and for converting the receive word, as received in binary notation, to engineering notation;

a display device responsive to display control signals for displaying alphanumeric symbols; and,

said computer means including a first display control processing means for generating display control signals that cause said display device to concurrently display the contents of the first transmit word both in engineering and binary notations, and said computer means including a second display control processing means for generating

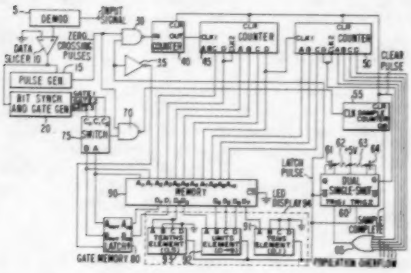
display control signals that cause said display device to concurrently display the contents of the received word both in binary and engineering notations.

4,393,499

ADAPTIVE SIGNAL QUALITY MEASUREMENT CIRCUIT FOR FSK AND FSK DEMODULATORS

Randall G. Evans, San Jose, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Mar. 11, 1981, Ser. No. 242,800
Int. Cl.³ H04B *17/00*; H04L *1/20*
U.S. Cl. 371—5 **8 Claims**



1. A circuit for measuring the signal quality of an antipodal stream of data bits comprising:

connected to said data stream, means for generating, at the same frequency as the bit frequency of said data stream, several different repetitive patterns of pulses, each pattern having a deadband region and an error region;

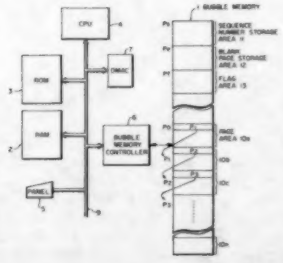
connected to said data stream and to said generating means, means for combining said stream with one of said patterns so that bits from said stream can be observed to fall within either of said regions by virtue of observing means connected to said combining means.

4,393,500

METHOD OF MODIFYING DATA STORED IN NON-VOLATILE MEMORY AND TESTING FOR POWER FAILURE OCCURRING DURING MODIFICATION

Ryoji Imazeki, Hachioji, and Michiya Inoue, Hino, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,840
Claims priority, application Japan, Sep. 4, 1979, 54-113260
Int. Cl.³ G06F *11/10*; G11C *29/00*
U.S. Cl. 371—13 **3 Claims**



3. A method of modifying data units and testing for a power failure that occurs during modifications using flag data stored in a bubble memory with a processor, comprising the steps of:

(a) reading out the flag data for one of the data units from the bubble memory with the processor;

(b) modifying the flag data for the one of the data units with the processor to indicate that a modification of the one of the data units is underway;

(c) writing the flag data back into the bubble memory with the processor;

(d) reading, modifying and writing the one of the data units stored in the bubble memory with the processor;

(e) reading out the flag data for the one of the data units with the processor;

(f) modifying the flag data for the one of the data units with the processor to indicate that the modification is completed;

(g) writing the flag data into the bubble memory with the processor;

(h) reading out the flag data from the bubble memory for all of the data units with the processor; and

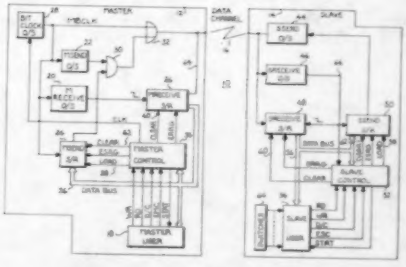
(i) testing the flag data for all of the data units with the processor to determine if all modifications have been completed, thereby determining if the power failure has occurred during modification of the data units.

4,393,501

LINE PROTOCOL FOR COMMUNICATION SYSTEM

Richard A. Kellogg, Syracuse; John B. May, Liverpool, and Brian C. Johnson, Syracuse, all of N.Y., assignors to General Electric Company, Somersworth, N.H.

Filed Feb. 26, 1981, Ser. No. 238,205
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—33 **10 Claims**



1. A method of serially transferring digital signal information items, between a master processing unit and a slave processing unit, each functioning as a sending unit and a receiving unit, comprising the steps of:

(a) sending, from said master processing unit and receiving at said slave processing unit, a clock signal having a predetermined bit rate;

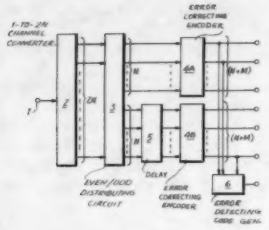
(b) sending from a sending unit and receiving at a receiving unit; a prescribed number of information items in bit serialized form, each information item being preceded by a clock signal, whereby the information items are sent and received at the bit rate of said clock signal; and

(c) sending from the receiving unit and receiving at the sending unit, after the prescribed number of information items have been received at the receiving unit, an acknowledgment signal representative of the receipt of the prescribed number of information items.

4,393,502
METHOD AND APPARATUS FOR COMMUNICATING DIGITAL INFORMATION WORDS BY ERROR-CORRECTION ENCODING

Masato Tanaka; Shunsuke Furukawa; Ikuo Iwamoto, and Toshitada Doi, all of Sony Corp., 6-7-35, Kitashinagawa, Shinagawa-Ku, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,625
Claims priority, application Japan, Oct. 9, 1979, 54-130310
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **43 Claims**

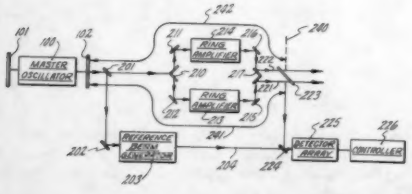


1. A method of communicating a sequence of digital information words, comprising the steps of: separating said information words into a sequence of odd information words and a sequence of even information words; time-displacing the separated odd and even information words from each other by a predetermined amount; encoding said odd information words in an error-correcting code; separately encoding said even information words in an error-correcting code; combining said encoded time-displaced odd and even information words into a transmission block; and transmitting said transmission block.

4,393,503
CAVITY LENGTH CONTROL SYSTEM FOR A MULTILINE HEL

Albert W. Angelbeck, Glastonbury, and Gary E. Palma, Rocky Hills, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,518
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—20 **4 Claims**



1. An apparatus for controlling the cavity length of an injection locked laser comprising:

(a) means for generating a master oscillator beam;

(b) means for generating a frequency-shifted beam therefrom, having at least two lines shifted in frequency from corresponding lines in said master oscillator beam by first and second predetermined frequencies;

(c) means for transmitting a portion of said master oscillator beam as a reference beam, along a predetermined reference path length;

(d) a resonant optical cavity comprising a gain medium, means for transporting a portion of said master oscillator beam about a cavity path length passing through said gain medium, and cavity length means for varying said cavity path length;

(e) means for coupling said portion of said master oscillator beam into said optical cavity, and for coupling an amplified beam out of said cavity along an amplified beam path, including said cavity path, having a variable length substantially equal to said predetermined reference path length and path length means for varying said variable length;

(f) path length control means, responsive to said frequency-shifted beam, said reference beam and said amplified beam, for forming a signal for equalizing said predetermined reference path length and said variable length, coupled to said path length means;

(g) cavity length control means, responsive to said frequency-shifted beam, said reference beam and said amplified beam, for generating a signal for controlling said cavity path length, further comprising:

(i) means for generating detected signals, at said first and second frequencies, from a reference detector responsive to said frequency-shifted beam and said reference beam and from an output detector responsive to said frequency-shifted beam to said amplified beam;

(ii) means for mixing said detected signals at said first frequency from both said detectors to form a first fine error signal, means for further mixing said signals at said second frequency from both said detectors to form a second fine error signal;

(iii) means for homodyning the detected signal from said reference detector to form a reference beat signal, having a beat frequency equal to the difference of said first and second frequencies, means for homodyning the signal from said output detector, to form an output beat signal at said beat frequency;

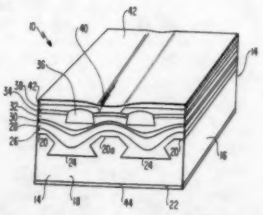
(iv) means for mixing said reference beat signal and said output beat signal to form a coarse error signal; and

(v) means for combining said first and second fine error signals with said coarse error signal in a predetermined manner to form a cavity length error signal for controlling said cavity length means.

4,393,504
HIGH POWER SEMICONDUCTOR LASER

Dan Botez, Mt. Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,511
Int. Cl.³ H01L *3/19*
U.S. Cl. 372—45 **8 Claims**



1. In a semiconductor laser having a pair of end faces at least one of which is partially transparent to light and comprising a substrate having a pair of opposed major surfaces, with a pair of spaced, substantially parallel grooves in a first major surface with a land therebetween; a first confinement layer overlying the first major surface of the substrate and the surfaces of the grooves; an active layer overlying the first confinement layer; a second confinement layer overlying the active layer; and first and second electrical contacts overlying portions of the second confinement layer and the second major surface respectively; wherein the substrate and the first confinement layer are of one

conductivity type and the second confinement layer is of the opposite conductivity type and wherein the index of refraction of the active layer at the wavelength of light emitted by the laser is greater than that of the first and second confinement layers;

the improvement which comprises a pair of spaced, substantially parallel anti-guiding regions on both sides of that portion of the second confinement layer over the land and extending a distance through the second confinement layer from a surface thereof towards, but not intersecting, the active layer, and having an index of refraction at said wavelength which is greater than that of the second confinement layer.

4,393,505

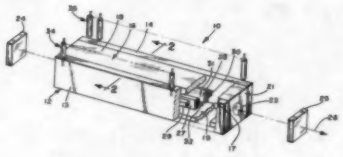
GAS DISCHARGE LASER HAVING A BUFFER GAS OF NEON

Theodore S. Fahlen, San Jose, Calif., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 927,428, Jul. 24, 1978, abandoned. This application Nov. 3, 1981, Ser. No. 371,637

Int. Cl.³ H01S *3/22*

U.S. Cl. 372—57 **4 Claims**



1. In an excimer laser comprising a chamber, spaced electrodes in said chamber defining a discharge zone therebetween, a source of d-c power, energy storage capacitor means electrically connected to said electrodes and to said source and adapted to be charged by the latter, switch means electrically connected between said capacitor means and said electrodes and operable to apply the charge voltage of said capacitor means across said electrodes, a lasing gas mixture in said chamber having a lasing gas selected from the group consisting of Ar and F_2, Xe and F_2, Xe and Br_2, Hg and Br_2, Hg and Cl_2, Xe and Cl_2 and Kr and F_2, said electrodes producing an electric discharge in said gas in said zone when said switch means is actuated whereby to convert said gas mixture to ArF, XeF, XeBr, HgBr, HgCl, XeCl and KrF, respectively, and optical means aligned with said discharge zone defining a laser cavity, the improvement consisting of

a buffer gas of Ne in said mixture.

4,393,506

SEALED-OFF RF EXCITED CO_2 LASERS AND METHOD OF MANUFACTURING SUCH LASERS

Peter Laakmann, and Katherine D. Laakmann, both of Laguna Niguel, Calif., assignors to Walwel, Inc., San Juan Capistrano, Calif.

Filed Nov. 17, 1980, Ser. No. 207,576

Int. Cl.³ H01S *3/22, 3/03*

U.S. Cl. 372—59 **11 Claims**

1. A method of constructing a sealed-off RF excited CO_2 waveguide laser comprising the steps of:

selecting aluminum structural members suitable for construction of a waveguide laser housing,

nickel-plating said aluminum structural members,

placing said structural members in a passivation solution until all exposed surfaces are covered by an oxidized coating, and

subjecting said structural members to a temperature of at least 100 degrees Centigrade and a vacuum of at least 10^{-4} Torr for a period of at least 72 hours.

9. A sealed-off RF excited CO_2 waveguide laser including a gettering substance in contact with the gas mixture contained within said laser, said substance having high sorbitivity to hydrogen gas at room temperature and decreasing sorbitivity to hydrogen gas with increasing temperature, further comprising a housing consisting of nickel-plated aluminum members, the surfaces thereof being passivated with a nickel oxide coating.

10. In an assembled sealed-off RF excited CO_2 waveguide laser of the type having a gas mixture contained within said laser the improvement comprising cellulose contained within said assembled laser in contact with the gas mixture, said cellulose specially prepared to ensure high sorbitivity to water vapor at room temperature and decreasing sorbitivity to water vapor with increasing temperature to absorb water vapor evolved by the gas mixture.

4,393,507

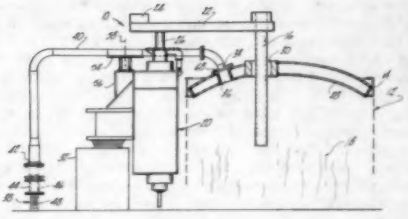
METHOD AND APPARATUS FOR CHARGING LIME INTO AN ELECTRIC ARC FURNACE

Ronald E. Miller; James E. O'Hara, and Arthur E. Rola, all of Jackson, Mich., assignors to Quanex Corporation, South Lyon, Mich.

Filed Jan. 5, 1981, Ser. No. 222,500

Int. Cl.³ F27D *3/10, 3/16*

U.S. Cl. 373—81 **14 Claims**

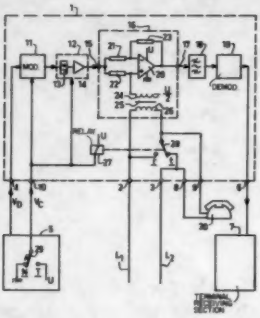


11. In an electric arc furnace having a shell with a top having a plurality of electrode ports therein through each of which an electrode projects downwardly into the interior of the shell for drawing an arc with a charge of metal to be melted therein and of the type in which fumes are evacuated from the interior of said shell, the improvement comprising an inlet port through said shell at a location laterally displaced from and outwardly of said electrode ports, a nozzle carried by said furnace and constructed and arranged to be disposed in registry with said inlet port, said nozzle being constructed and arranged for movement to a first position wherein said nozzle is in registration with said inlet port for discharging particulate matter in a gas stream into said shell and to a second position spaced from said first position and wherein said top shields said nozzle from heat within said shell, said nozzle having a cross sectional shape, cross-sectional dimensions, an axial direction and an orientation which are constructed and arranged to direct particulate matter discharged therefrom in a gas stream through said inlet port and generally toward the center of the upper surface of the charge of metal in said shell without any substantial portion of the particulate matter impinging directly on any of the electrodes, and a cover movable to open and closed positions to effectively close said inlet port when said nozzle is in said second position and to open said inlet port when said nozzle is in said first position.

4,393,508
SYSTEM FOR LOCALLY TESTING A MODEM EMPLOYING FREQUENCY SHIFT KEYING

Robert Boudault, Limours, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1981, Ser. No. 276,580
Claims priority, application France, Jun. 23, 1980, 80 13867
Int. Cl.³ H04B 3/46
U.S. Cl. 375—9 5 Claims

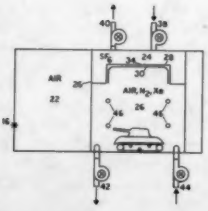


1. A system for locally testing a modem employing frequency shift keying and being coupled to a two-wire transmission line, the two frequencies transmitted by the modem being lower than the two received frequencies and being produced by a modulator, in the form of multivibrator controlled by the data and connected to a transmission filter, the test system comprising means for looping the modem at the transmission line side in response to a test control signal, characterized in that said modulator comprises means for causing said modulator to produce, in response to said test control signal, two test frequencies, said two test frequencies being the respective products of said two frequencies transmitted by said modem multiplied by a multiplying factor, said multiplying factor being substantially equal to the ratio between the average values of said two received frequencies and said two frequencies transmitted by said modem, and said transmission filter comprises means for changing, in response to said test control signal, the transfer characteristics of said transmission filter in order that said two test frequencies may be transmitted therethrough.

4,393,509
SOURCE-REGION ELECTROMAGNETIC PULSE SIMULATOR

George Merkel, Springfield, Va., and William D. Scharf, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1981, Ser. No. 252,737
Int. Cl.³ G21G 3/04
U.S. Cl. 376—156 19 Claims

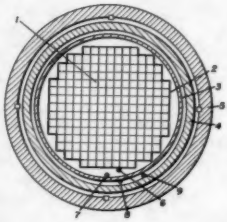


1. A method of simulating, in conjunction with a source of ionizing radiation, intense pulsed electromagnetic fields and time varying air conductivity caused by the gamma radiation associated with a nuclear detonation comprising the steps of:
enclosing a space, said space including said source of ionizing radiation;
dividing said space into a first space, a second space and a third space;
separating said first space from said second space by a first gas impermeable, radiation permeable barrier;
separating said second space from said third space by a second gas impermeable, radiation permeable barrier;
providing a guided wave structure adjacent to said second gas impermeable, radiation permeable barrier;
introducing a selected non-ionizing gas into said second space; and
pulsing said guided wave structure with a high voltage pulser.

4,393,510
REACTOR FOR PRODUCTION OF U-233

Linton W. Lang, Richland, Wash., and Robert L. Stetson, Moraga, Calif., assignors to Pacific Nuclear Fuels, Inc., Richland, Wash.

Continuation-in-part of Ser. No. 318,039, Jul. 20, 1973, abandoned. This application Jul. 1, 1976, Ser. No. 701,806
Int. Cl.³ G21C 3/22
U.S. Cl. 376—172 2 Claims



1. A light water nuclear power reactor utilizing fertile thorium and fissionable uranium fuel of 2 to 3 percent enrichment in combination in a blanket and core respectively for producing U-233 wherein the U-232 content in the irradiated thorium is minimized and in which said produced U-233 is recycled, comprising:
a pressure vessel container;
a central core member positioned in said vessel and comprising a plurality of fuel elements having fissionable uranium fuel positioned therein;
a core baffle positioned around the periphery of said central core forming a part thereof and comprising a plurality of fuel elements having fertile thorium fuel positioned therein, said core baffle defining the outer periphery of the core;
a core barrel fixedly positioned in said vessel and surrounding said core baffle;
the fuel elements in said central core member and said core baffle each comprising
a central section of fissionable uranium oxide pellets,
outer sections of hollow thin-walled thorium oxide pellets,
plenum sections interposed between said inner and outer sections,
spring and spacer means positioned within said plenum sections,
a moderating material positioned on at least one side of each of said plenum sections,
cladding enclosing said pellets;
a first set of fuel elements surrounding said central core member and positioned between said core baffle and said core barrel in spaced relation thereto and having only fertile thorium fuel positioned therein;

a second set of fuel elements surrounding said core barrel in spaced relation thereto and having only fertile thorium fuel positioned therein;

a thermal shield fixedly positioned in said vessel and surrounding said second set of fuel elements;

each of the fuel elements in said first and second sets comprising a plurality of stacked thorium oxide pellets within a cladding wherein all of said thorium oxide pellets are hollow, said hollow thorium oxide pellets having inner diameters which vary axially from a maximum at the radial center of the fuel element to a minimum at each end of the fuel element;

means for supplying a flow of coolant through said vessel;

the U-232 content in the total uranium present in said reactor averaging less than 10 parts per million, said total uranium including U-233 which has been reprocessed and recycled from irradiated thorium.

4,393,511

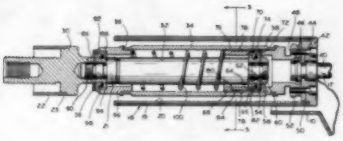
OUTER ROTATION BEARING FOR X-RAY TUBE

Richard A. Jens, Milwaukee, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,909

Int. Cl.³ H01J *35/10*

U.S. Cl. 378—128 **4 Claims**



1. A rotating anode x-ray tube, comprising:

an envelope;

a stationary stem member passing through a wall of said envelope and having a first part outside said envelope for receiving an external electrical connection and a second part extending exially into said envelope;

a rotatable tubular member within said envelope and coaxial with said stem member second part, said tubular member having first and second axially separated parts disposed about the second part of said stem member;

an x-ray target anode supported by an axially disposed stud having a first end fixed to said tubular member second part and a second end fixed to said anode;

rotor means for rotating said anode;

a front bearing for rotatably supporting the second part of said tubular member on said stem member second part while resisting conduction of heat between them, comprising a first bearing portion fixed to said stem member second part, a second bearing portion nonrotatably fixed within said tubular member second part with clearance between them to reduce thermal conduction, and first ball means between said first and second bearing portions; and

a rear bearing separated from said rotor assembly by said front bearing for rotatably supporting the first part of said tubular member on said stem member second part, comprising a third bearing portion fixed to said stem member second part, a fourth bearing portion fixed within said tubular member first part, and second ball means between said third and fourth bearing portions, with good thermal and electrical contact from said tubular member, via said fourth bearing portion, second ball means, and third bearing portion, to said stem member second part;

whereby heat from said target anode is preferentially conducted between said tubular member and said stem via said rear bearing.

4,393,512

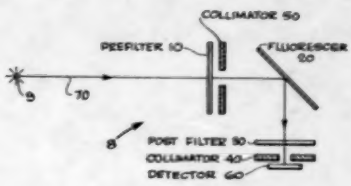
HYPER-FILTER-FLUORESCER SPECTROMETER FOR X-RAYS ABOVE 120 KEV

Ching L. Wang, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 7, 1981, Ser. No. 281,141

Int. Cl.³ G01N *23/22*

U.S. Cl. 378—156 **9 Claims**



1. In a spectrometer system to provide measurements of x-rays, wherein these x-rays emitted from a source are transmitted through a pre-filter, directed by a first collimator to a fluorescer, re-emitted from the fluorescer as K-fluorescence lines toward a post-filter and directed again by a second collimator to an x-ray detector, the improvement which comprises:

said pre-filter for transmitting x-rays, having a predetermined absorption edge;

said post-filter for transmitting x-rays to said detector, having a predetermined absorption edge which is more than the absorption edge of said pre-filter; and

said fluorescer for emitting K-fluorescence lines toward said post-filter, having a predetermined absorption edge substantially equal to the absorption edge of said post-filter.

4,393,513

INPUT SIGNAL LEVEL CONTROL DEVICE FOR RECEIVER

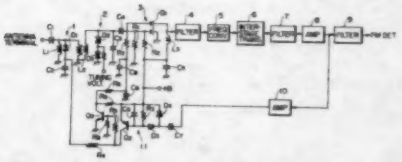
Tomoshisa Yokogawa, and Shintaro Gomi, both of Saitama, Japan, assignors to Pioneer Electric Corporation, Tokyo, Japan

Filed May 14, 1981, Ser. No. 263,543

Claims priority, application Japan, May 19, 1980, 55-68535[U]

Int. Cl.³ H04B *1/16*; H03G *3/30*

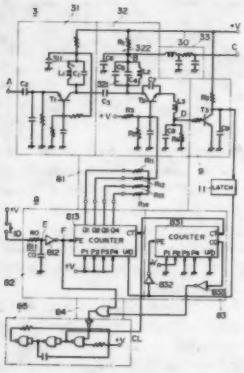
U.S. Cl. 455—243 **8 Claims**



4. An input signal level control device for a receiver receiving an input signal having a particular electric field strength, comprising: an input signal source; an attenuating means for attenuating a level of said input signal; an amplifier means for amplifying said attenuated input signal; a signal processing means for processing said amplified signal; and a control means receiving said processed signal, said control means activating said attenuating means when said electric field strength of said input signal reaches a first level and controlling said amplifying means when said electric field strength of said input signal reaches a second level greater than said first level, said control means having a first transistor coupled with a second transistor, said attenuating means being activated by an output of said

first transistor and said amplifier means being controlled by an output of said second transistor.

4,393,514
SUPERREGENERATIVE RECEIVER
Yoshikazu Minakuchi, Neyagawa; Toshio Abiko, Ibaragi, and Hiromitsu Inoue, Soraku, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Dec. 11, 1980, Ser. No. 215,355
Claims priority, application Japan, Dec. 15, 1979, 54-163078
Int. Cl.³ H04B 1//16
U.S. Cl. 455—336 **9 Claims**



8. A superregenerative receiver comprising:

quenching oscillator means for converting a received signal into a low frequency signal, said quenching oscillator means including a transistor,

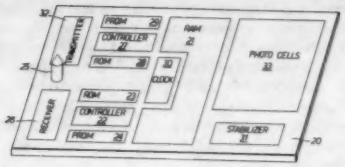
oscillation condition modification means for modifying at least one parameter of said transistor to vary the efficiency of said quenching oscillator means;

control means responsive to a control output of said quenching oscillator means for controlling said oscillation condition modification means in order to optimize said transistor parameter in order to maximize the efficiency of said quenching oscillator means by placing said oscillator means into an optimum oscillation condition,

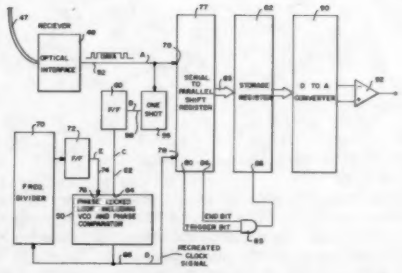
said oscillation condition modification means being responsive to said control means to digitally vary said parameter in a first direction until the operation of said quenching oscillation means ceases, said oscillation condition modification means varying said parameter in a direction opposite said first direction by a predetermined amount to establish said optimum operating condition.

4,393,515
PROCESSOR ARRANGEMENT
Frederick B. de Neumann, Rayleigh, England, assignor to The Marconi Company Limited, Chelmsford, England
Filed Jan. 28, 1981, Ser. No. 229,136
Claims priority, application United Kingdom, Feb. 5, 1980, 8003814
Int. Cl.³ H04B 9/00
U.S. Cl. 455—606 **19 Claims**

1. A processor arrangement including a plurality of individual processors mounted within a common chamber, each said individual processor comprising means for freely radiating electromagnetic waves, directly without regeneration, to a plurality of other ones of said individual processors, and means having an omnidirectional receiving characteristic disposed for receiving, directly without regeneration, electromagnetic waves from a plurality of other ones of said individual processors, with data communication between said individual processors being by means of the radiated electromagnetic waves.



4,393,516
DATA TRANSMISSION SYSTEM AND METHOD
Abdallah M. Itani, Ballston Spa, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Mar. 9, 1979, Ser. No. 19,114
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 **19 Claims**



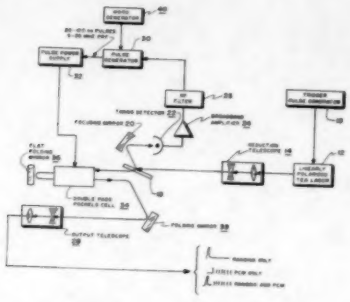
1. A data transmission system for transferring digital information which has been converted to a multiframe format of serial bits over a single optical cable, said multiframe format including sequential data frames each containing a sequence of bits having a predetermined bit frequency wherein the total number of said bits in each said data frame includes a predetermined number of data bits containing the digital information, the system including an optical encoder for converting the bits into a single optical signal for transfer by way of the optical cable and an optical decoder for receiving the optical signal and reproducing the bits, and means for retrieving the digital information from said data bits, comprising: clock means including a phase locked loop incorporating a variable oscillator outputting a clock signal having a frequency substantially equal to said bit frequency and means responding to said bits and said clock signal to produce a predetermined phase relationship between said clock signal and said bits, and frame decoder means for selecting said data bits from the sequence of bits in each said data frame using said clock signal, said clock means including means for sensing the duration of said data frames, and frame interval means for determining measured frame intervals using said clock signal, said clock means comparing said measured frame intervals and the sensed duration of said data frames and adjusting said variable oscillator to make said measured frame intervals substantially equal in length to said data frames and to produce said predetermined phase relationship.

4,393,517

PULSE CODE MODULATION OF LASER PULSE TAIL

Rudolph G. Buser, Wall, N.J.; Gregory R. Osche, Acton, Mass.; Neal T. Nomiyama, Reston, and Robert S. Rohde, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1980, Ser. No. 192,276
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 8 Claims



1. A system for pulse code modulating the tail portions of a train of pulsed laser beams to provide coded messages for information transfer, said system comprising:

linearly polarized CO_2 TEA laser activated by a trigger pulse generator to produce a train of output laser beam gain switched spikes with tail portions therefrom;

telescoping optics for demagnifying the output laser beam;

a beam splitter positioned at the output of said telescoping optics in optical alignment with said linearly polarized CO_2 TEA laser and said telescoping optics, said beam splitter placed at the Brewster's angle to simultaneously reflect a portion of each output laser beam gain switched spike and tail portion while transmitting the remainder therethrough;

an electrooptics Pockels Cell modulator means in optical alignment with said beam splitter to directly receive the laser beam gain switched spike and tail portions transmitted through said beam splitter;

an electronic modulating circuit that receives the reflected portion of the output laser beam gain switched spike and tail portion onto a timing detector and after a time delay by said timing detector produces a train of coded pulse words of said tail portion that is applied to a high voltage pulse power supply wherein a train of high voltage pulses produced at the repetition rate of said train of coded pulse words are applied to said electrooptics Pockels Cell modulator means simultaneously with the arrival of the tail portion that is transmitted through the beam splitter wherein said train of high voltage pulses pulse code modulate said tail portion while selectively leaving said gain switched spike unmodulated said spike being used for ranging; and

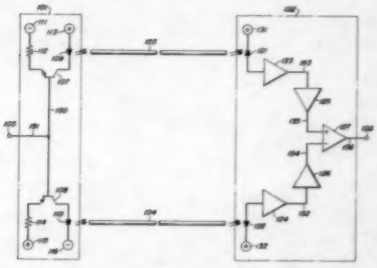
mirror and output optical means for transmitting the pulse code modulated data to a receiving station.

4,393,518

OPTICAL COMMUNICATION ARRANGEMENT

Bruce E. Briley, Countryside, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1981, Ser. No. 225,514
Int. Cl.³ H04B 9/00
U.S. Cl. 455—617 9 Claims



1. An optical transmission arrangement adapted to compensate for harmonic frequency distortion, comprising:

transmitter means responsive to an electrical analog input signal having a positive and a negative portion for generating first and second analog optical signals each having harmonic frequency components equivalent to those of the other of said optical signals and representative of said positive and negative portions, respectively;

receiver means; and

optical waveguide means for guiding said first and second optical signals from said transmitter means to said receiver means;

said receiver means for combining said first and second optical signals and canceling certain of said equivalent harmonic frequency components to generate an electrical analog output signal representative of said input signal and having harmonic frequency components representative of only particular ones of said harmonic frequency components of said optical signals

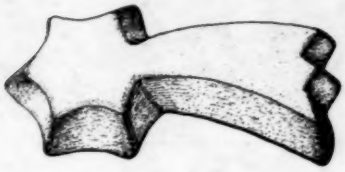
DESIGN PATENTS

GRANTED JUL. 12, 1983

ERRATA

For CLASS	See PATENT NO.
D07–311	269,680

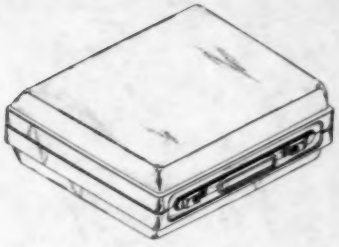
269,644
CAKE
Donato De Pascalis, Via Bisalta 7, Turin, Italy
Filed Mar. 27, 1981, Ser. No. 268,114
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—15



269,645
FORMAL MEN'S SUIT
Jerry L. Cameron, 919 Mason St., LaGrange, Ga. 30240
Filed Jul. 31, 1981, Ser. No. 289,046
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29

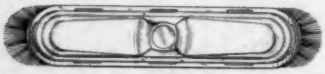
269,646
LINEN BAG
Beatrice K. Schaer, 41 Wolfpit Ave., P.O. Box 26, Norwalk, Conn. 06851
Filed May 29, 1981, Ser. No. 268,390
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

269,647
CASE FOR A TYPEWRITER
Angelo M. La Barbera, Liverpool, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Oct. 15, 1981, Ser. No. 311,721
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—72



269,648
STORAGE CONTAINER
Donald Wilcox, 165 Pearl St., Seymour, Conn. 06483, and Nobile Zambrano, 86 Alps Rd., Branford, Conn. 06405
Filed Nov. 28, 1980, Ser. No. 211,396
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—73

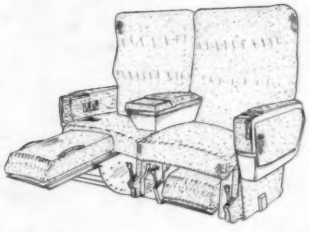
269,649
BROOM HEAD
David A. Jones, Kettering, Ohio; Yasuhiro Koshido, Bloomingdale, and Daniel A. Maust, Winfield, both of Ill., assignors to The Drackett Company, Cincinnati, Ohio
Filed Nov. 28, 1980, Ser. No. 210,893
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—03



269,650
PAINT ROLLER FRAME
Philip J. Allison, Saint John, Canada, assignor to T. S. Simms & Co. Limited, Saint John, Canada
Filed Mar. 12, 1981, Ser. No. 242,929
Claims priority, application Canada, Dec. 29, 1980, 29-12-80-1
Term of patent 14 years
Int. Cl. D8—*05;* D4—*04*
U.S. Cl. D4—38.1

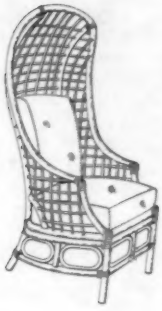
269,651
SEAT
Dorothy L. Blowers, Los Angeles, Calif., assignor to Pacific Furniture Manufacturing Co., Compton, Calif.
Filed Aug. 4, 1980, Ser. No. 175,154
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

269,652
DUAL AIRCRAFT SEAT
Eric J. McKean, Lugarno, and David P. Downey, Five Dock, both of Australia, assignors to Qantas Airways Limited, Australia
Filed Mar. 13, 1980, Ser. No. 130,081
Claims priority, application Australia, Sep. 13, 1979, 78993
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



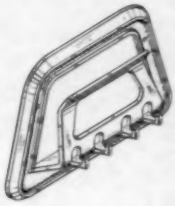
269,653
ARM CHAIR
Didier Deconinck, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Feb. 11, 1981, Ser. No. 233,509
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

269,654
CHAIR
Mike T. Claman, New York, N.Y., assignor to Lewittes Furniture Enterprises, Inc., New York, N.Y.
Filed Feb. 20, 1981, Ser. No. 236,443
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

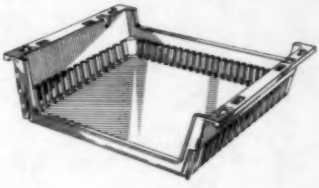


269,655
CHAIR
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Feb. 23, 1981, Ser. No. 237,455
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

269,656
COMBINED MAIL AND KEY RACK OR THE LIKE
James B. Swett, Altamonte Springs, Fla., and David G. Bragin, Brooklyn, N.Y., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 29, 1981, Ser. No. 278,533
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—130



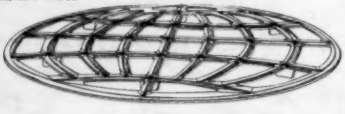
269,657
STORAGE TRAY FOR ATTACHMENT BENEATH A SHELF
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 26, 1981, Ser. No. 277,926
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—199

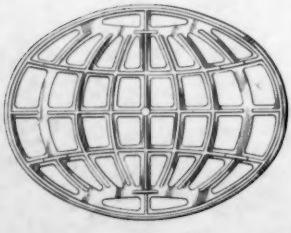


269,658
INFANT WRAPPING BLANKET
Marta Bor, 10521 - 128 St., Edmonton, Alberta, Canada T5N 1W3
Filed Sep. 15, 1980, Ser. No. 187,187
Claims priority, application Canada, May 6, 1980, 06-05-80-5
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—267

269,659
COMBINED GOBLET AND DRINKING TUBE
Richard D. Holloway, 40 Elsham Rd., London, W.14, England
Filed Apr. 2, 1982, Ser. No. 364,773
Claims priority, application United Kingdom, Oct. 15, 1981, 1003007
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—11

269,660
ROASTING RACK
Robert M. Powers, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Apr. 9, 1981, Ser. No. 252,410
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—409





269,661
HOOK
Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc.
Filed Apr. 25, 1980, Ser. No. 143,021
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

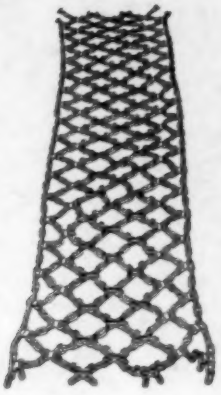
269,662
YEAST THERMOMETER
James N. Ottaway, 1090 Madison La., Salinas, Calif. 93907
Filed Mar. 20, 1981, Ser. No. 245,847
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

269,663
POLE LEVEL
Gary E. Smith, and Edward D. Parks, both of 21060 Meekland Ave., Hayward, Calif. 94541
Filed Jan. 30, 1981, Ser. No. 230,353
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

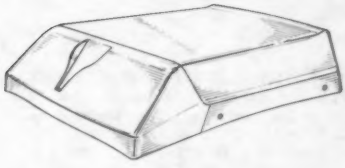
269,664
ELECTRONIC MARKER FOR BURIED UTILITIES
Barry M. Marks, Austin, Tex., assignor to A.P.C. Industries, Inc., Austin, Tex.
Filed Sep. 26, 1980, Ser. No. 191,088
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—104

269,665
MOBILE
Harold Lehr, 307 E. 92nd St., New York, N.Y. 10028
Filed Mar. 23, 1981, Ser. No. 246,577
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—141

269,666
TIRE CHAIN FOR SLIP PREVENTION OF VEHICLE
Kare Espedalen, Grenseveien 5, N-3290 Stavern, Norway
Filed Mar. 11, 1980, Ser. No. 129,377
Claims priority, application Norway, Sep. 20, 1979, 60038
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—154

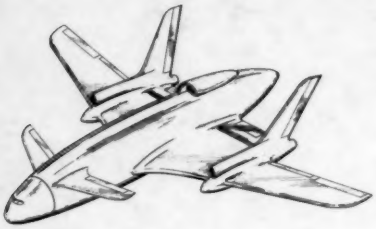


269,667
AUTOMOBILE ROOF TOP CARRIER
Don R. Taylor, 1423 Ruffner St., Birmingham, Mich. 48008, and Edward J. Prentice, 959 Loma Verde, Palo Alto, Calif. 94303
Filed Mar. 6, 1981, Ser. No. 241,219
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

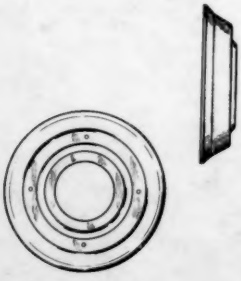


269,668
BOARDSAILING BOARD
Henry H. Schweitzer, 317 Beirut, Pacific Palisades, Calif. 90272
Continuation of Ser. No. 730,872, Oct. 8, 1976. This application Apr. 27, 1979, Ser. No. 34,044
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—303

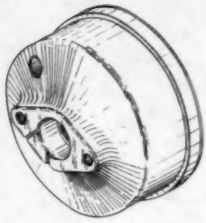
269,669
AIRPLANE
John P. Hancock, Marietta, and Rollo G. Smethers, Jr., Atlanta, both of Ga., assignors to Lockheed Corporation, Burbank, Calif.
Filed Sep. 11, 1980, Ser. No. 186,722
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—332



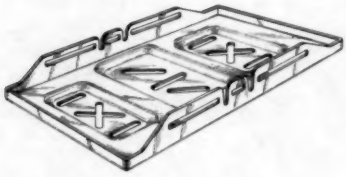
269,670
BACKING PLATE FOR SERVOMOTOR DIAPHRAGM
Keith H. Fulmer, Mishawaka, and Oswald O. Kytta, South Bend, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.
Filed Aug. 8, 1980, Ser. No. 176,308
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1



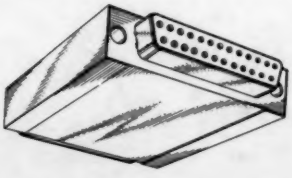
269,671
END FRAME FOR A SERVOMOTOR
John J. Horsting, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Oct. 31, 1980, Ser. No. 202,896
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1



269,672
TRAY FOR A BATTERY
Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.
Filed Apr. 6, 1981, Ser. No. 251,510
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10

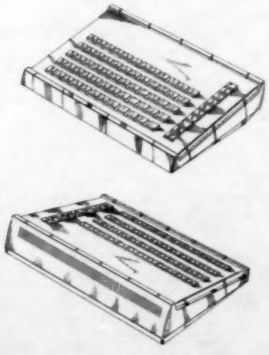


269,673
VARIABLE CABLE CONNECTOR INTERFACE FOR DATA PROCESSING EQUIPMENT
Hans O. Johansson, Lidingö; Hans G. Nilsson, Solna, and Louis Jernberg, Nacka, all of Sweden, assignors to Svea Data Communication & Computer Aktiebolag, Solna, Sweden
Filed Sep. 28, 1979, Ser. No. 79,920
Claims priority, application Sweden, Mar. 28, 1979, 798/79
Term of patent 3½ years
Int. Cl. D13—*03;* D14—*01*
U.S. Cl. D13—24

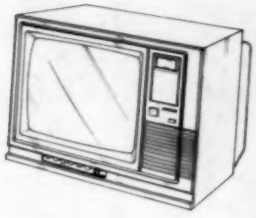


269,674
TELEPHONE
Takeshi Hirota, and Toshihiro Inagi, both of Yokohama, Japan, assignors to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan
Filed Jan. 15, 1981, Ser. No. 225,336
Claims priority, application Japan, Sep. 18, 1980, 55-38234
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

269,675
TELEPHONE BUSY LAMP FIELD CONSOLE
Donald A. Foggia, Ocean, N.J.; Deepak R. Muzumdar, Boca Raton, Fla.; Gerhart F. Klaiber, Boca Raton, Fla., and Rolf E. Schneider, Boca Raton, Fla., assignors to Siemens Corporation, Iselin, N.J.
Filed Oct. 23, 1980, Ser. No. 199,984
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

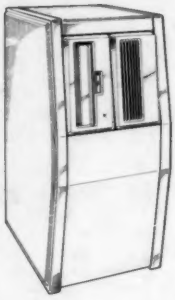


269,676
TELEVISION RECEIVER
Akira Takahashi, Tokyo; Noritaka Segawa, Koganei, and Takeichi Obata, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 21, 1981, Ser. No. 256,096
Claims priority, application Japan, Jan. 23, 1981, 56-1901
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



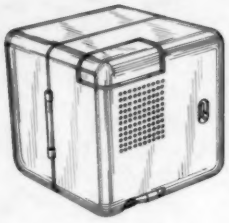
269,677
TELEVISION RECEIVER
Taisuke Kashima; Shigeki Gushiken, both of Tokyo; Kazuyuki Tsuburaya, Kodaira, and Yasusuke Seki, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 21, 1981, Ser. No. 256,097
Claims priority, application Japan, Oct. 27, 1980, 55-44536
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—80

269,678
COMPUTER
Benjamin F. Cooper, San Francisco, and Paul D. Major, Emeryville, both of Calif., assignors to Micromation, Inc., San Francisco, Calif.
Filed Aug. 7, 1981, Ser. No. 291,183
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—102

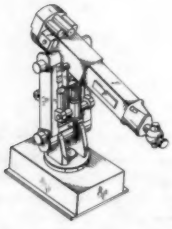


269,679
ELECTRONIC COMPUTER
Shinichi Morooka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 23, 1980, Ser. No. 219,589
Claims priority, application Japan, Jul. 9, 1980, 55-27761
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

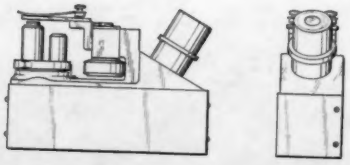
269,680
BEVERAGE DISPENSER OR SIMILAR ARTICLE
Achille Prandelli, Concesio, Italy, assignor to Ottopran S.r.l., Collebeato, Italy
Filed Jun. 8, 1981, Ser. No. 271,075
Claims priority, application Italy, Dec. 23, 1980, 7092/80[U]
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—311



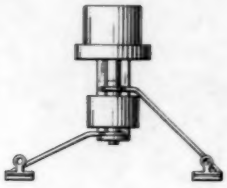
269,681
ROBOT ARM
Alfred H. Morser, and Robert C. Watson, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jan. 12, 1981, Ser. No. 224,304
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



269,682
FIELD MICROSCOPE
Kenichi Yokota, Tokyo, Japan, assignor to Swift Instruments, Inc., Boston, Mass.
Filed Aug. 1, 1980, Ser. No. 174,636
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—131



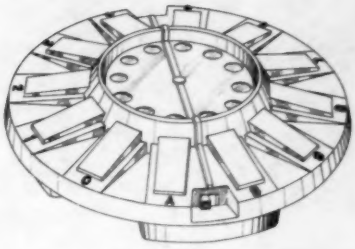
269,683
ELECTRIC SHEET MUSIC PAGE TURNER
Bruce E. Barbour, 41-37 52nd St., Woodside, N.Y. 11377
Filed Mar. 9, 1981, Ser. No. 242,063
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D17—99



269,684
WRITING INSTRUMENT OR SIMILAR ARTICLE
Richard Luntz, P.O. Box 24234, Lyndhurst, Ohio 44924
Filed Jun. 17, 1981, Ser. No. 274,495
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47

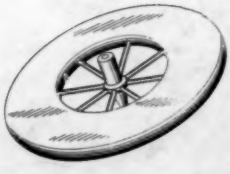
269,685
DESK NAME PLATE
Kenneth R. Lansdowne, 550 Bright St., San Francisco, Calif. 94132
Filed Sep. 30, 1980, Ser. No. 192,298
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—15

269,686
ELECTRONIC GAME CASING
Per O. Hoel, 11 Hesperus Cir., Magnolia, Mass. 01930
Filed Feb. 9, 1981, Ser. No. 232,978
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

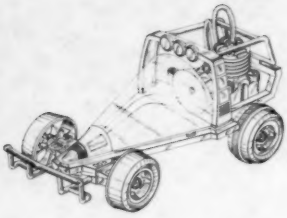


269,687
ANIMATED FIGURE RING TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Aug. 5, 1981, Ser. No. 291,641
Claims priority, application Japan, Feb. 17, 1981, 56-6081
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59

269,688
SPINNING TOY
Lester V. Molenaar, P.O. Box 777, Willmar, Minn. 56201
Filed Nov. 18, 1980, Ser. No. 207,760
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—95

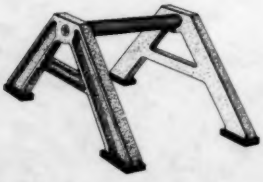


269,689
TOY VEHICLE
Tetsuo Ohkado, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan
Filed Feb. 25, 1981, Ser. No. 237,885
Claims priority, application Japan, May 15, 1980, 55-19081
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—128

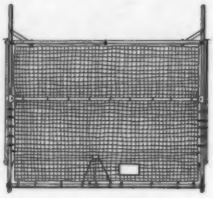


269,690
TOY MASK RESEMBLING A CHICKEN BEAK
Jeff Harris, 1910 Westridge Rd., Los Angeles, Calif. 90049; Jack Horwitz, 3533 Moore St., Los Angeles, Calif. 90066, and Charles Chambers, 935 N. Rose St., Burbank, Calif. 91505
Filed Feb. 6, 1981, Ser. No. 232,179
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—190

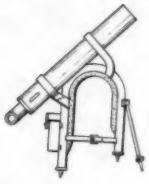
269,691
PORTABLE EXERCISE STAND
Richard Ornstein, 46 Hawthorne Rd., Garden City, N.Y. 11530, and Jerry Vassilatos, 214 Ridge Rd., New City, N.Y. 10956
Filed Sep. 29, 1980, Ser. No. 191,485
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191



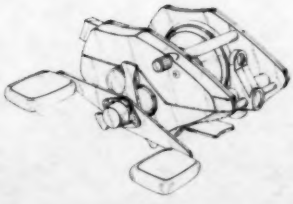
269,692
TENNIS PRACTICE NET
Tsugio Hirabayashi, Tokyo, and Michio Nakai, Ebina, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 15, 1980, Ser. No. 216,184
Claims priority, application Japan, Jun. 19, 1980, 55-24586
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—200



269,693
MORTAR
John J. Dobias, 1212 Sumach Dr., Windsor, Ontario, Canada N8S 2S4
Filed Mar. 2, 1981, Ser. No. 239,432
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—3

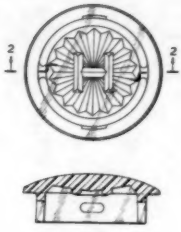


269,694
REEL FOR FISHING OR THE LIKE
Seiji Myojo, Sakai, Japan, assignor to Shimano Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Apr. 30, 1981, Ser. No. 259,028
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



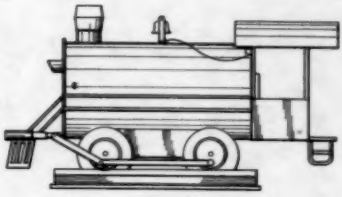
269,695
ROOM DEODORIZER DISPENSER
William J. O'Neil, Jr., Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed Jun. 29, 1981, Ser. No. 278,819
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

269,696
CAP FOR A FAUCET HANDLE
James E. Niemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Jul. 17, 1980, Ser. No. 169,538
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

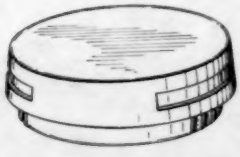


269,697
SPRINKLER SYSTEM CONTROL HOUSING
Cleve A. Graham, Port Hueneme; Craig R. Tisserat, Alta Loma, and Enric C. Mendoza, Walnut, all of Calif., assignors to Clemar Manufacturing Corp., Azusa, Calif.
Filed Dec. 3, 1980, Ser. No. 212,404
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—38

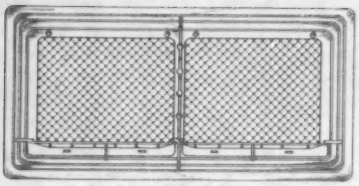
269,698
STOVE
Donald A. Crawford, Box 153, Smelterville, Id. 83868
Filed Mar. 3, 1981, Ser. No. 240,474
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



269,699
AIR FRESHENER CONTAINER
Timothy J. May, Hilbert, and David W. Wendt, Madison, both of Wis., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Jul. 14, 1981, Ser. No. 283,221
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

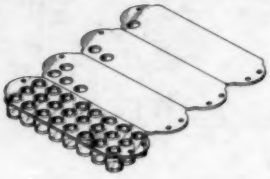


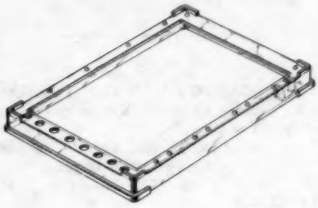
269,700
VENTILATOR
Elwin E. Peirce, 3890 Monroe Ave. Northeast, and Arthur L. Waltz, 4415 - 75th Ave. Southeast, both of Salem, Oreg. 97301
Filed Dec. 4, 1978, Ser. No. 966,137
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



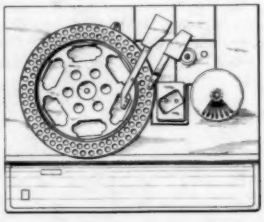
269,701
FULL BODY WEIGHT TRACTION DEVICE
Jack V. Miller, Sierra Madre, Calif., assignor to Gravity Guidance, Inc., Pasadena, Calif.
Filed May 10, 1982, Ser. No. 376,512
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—03

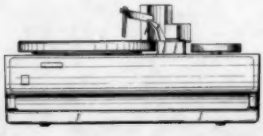
269,702
MICROVETTE ASSEMBLY
Osmo Suovaniemi; Pertti Ekholm, both of Helsinki; Esko Kaukanen, Espoo, and Aarre Kukka, Helsinki, all of Finland, assignors to Kommandittiyhtio Finnpipette Osmo A. Suovaniemi, Finland
Filed Oct. 27, 1980, Ser. No. 201,327
Claims priority, application Finland, Apr. 28, 1980, 332/80
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—8





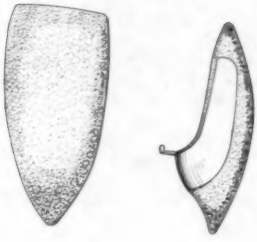
269,703
PIPETTOR
Bernard Parker, Westport, Conn., assignor to Baker Instruments Corp., Bethlehem, Pa.
Filed Mar. 27, 1981, Ser. No. 248,530
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—8



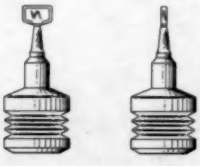


269,704
BASE FOR A FALSE TOOTH
Ehrenfried G. B. Wolf, Rte. 1, Box 143 A, Raymond, Wash. 98577
Filed Jun. 9, 1980, Ser. No. 139,785
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

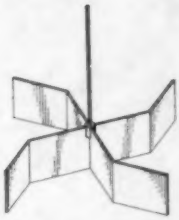
269,705
FALSE TOOTH
Ehrenfried G. B. Wolf, Rte. 1, Box 143 A, Raymond, Wash. 98577
Filed Jun. 9, 1980, Ser. No. 139,787
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



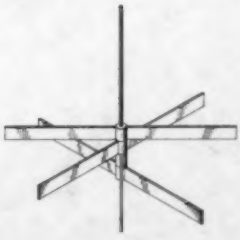
269,706
DISPENSING CONTAINER FOR PHARMACEUTICAL DILUENTS
Brian C. Green, Vernon Hills, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Nov. 5, 1980, Ser. No. 203,567
Term of patent 14 years
Int. Cl. D24—*02, 04;* D9—*01*
U.S. Cl. D24—63



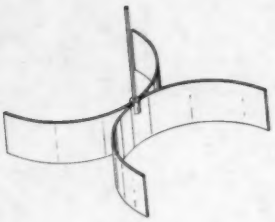
269,707
DECORATIVE SLAT ASSEMBLY FOR A SUSPENDED CEILING OR THE LIKE
Jacques G. L. Thual, Paris, France, assignor to Hunter Douglas International N.V., Willemstad, Netherlands Antilles
Filed Apr. 22, 1981, Ser. No. 256,300
Claims priority, application France, Oct. 23, 1980, 803288
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—88



269,708
DECORATIVE SLAT ASSEMBLY FOR A SUSPENDED CEILING OR THE LIKE
Jacques G. L. Thual, Paris, France, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles
Filed Apr. 22, 1981, Ser. No. 256,301
Claims priority, application France, Oct. 23, 1980, 803288
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—88

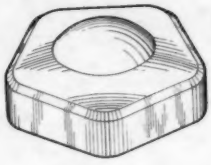


269,709
DECORATIVE SLAT ASSEMBLY FOR A SUSPENDED CEILING OR THE LIKE
Jacques G. L. Thual, Paris, France, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles
Filed Apr. 22, 1981, Ser. No. 256,517
Claims priority, application France, Oct. 23, 1980, 803288
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—89

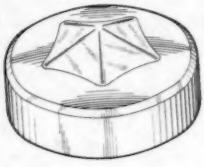


269,710
CIGAR AND CIGARETTE FILTER PERFORATOR
Rafael Torreblanca Cervantes, Malaga, Spain, assignor to The Westbury Foundation, Andorra and Dispositivos Reductores de Tabaco, S.A. (Sodire), Spain
Filed Jun. 29, 1981, Ser. No. 278,382
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51

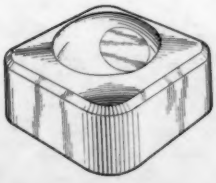
269,711
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,033
Claims priority, application United Kingdom, Apr. 28, 1981, 1000024
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



269,712
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,057
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



269,713
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,156
Claims priority, application United Kingdom, Apr. 28, 1981, 1000198
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



269,714

PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

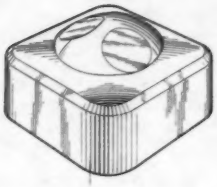
Filed Jun. 3, 1981, Ser. No. 270,157

Claims priority, application United Kingdom, Apr. 28, 1981, 1000199

Term of patent 14 years

Int. Cl. D28—*01*

U.S. Cl. D28—2



269,715

PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

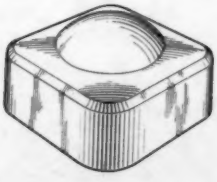
Filed Jun. 3, 1981, Ser. No. 270,158

Claims priority, application United Kingdom, Dec. 4, 1980, 997904

Term of patent 14 years

Int. Cl. D28—*01*

U.S. Cl. D28—2



269,716

PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

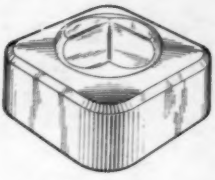
Filed Jun. 3, 1981, Ser. No. 270,189

Claims priority, application United Kingdom, Apr. 28, 1981, 1000201

Term of patent 14 years

Int. Cl. D28—*01*

U.S. Cl. D28—2



269,717

PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, Fed. Rep. of Germany, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

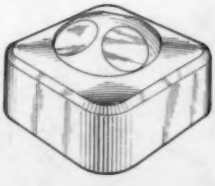
Filed Jun. 3, 1981, Ser. No. 270,190

Claims priority, application United Kingdom, Apr. 28, 1981, 1000200

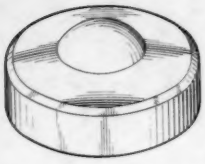
Term of patent 14 years

Int. Cl. D25—*01*

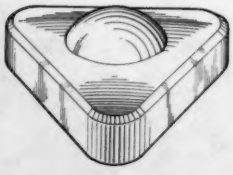
U.S. Cl. D28—2



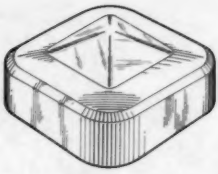
269,718
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,191
Claims priority, application United Kingdom, Apr. 28, 1981, 1000202
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



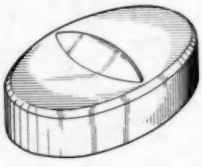
269,719
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,192
Claims priority, application United Kingdom, Apr. 28, 1981, 1000203
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



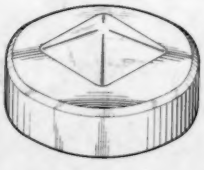
269,720
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,193
Claims priority, application United Kingdom, Apr. 28, 1981, 1000205
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



269,721
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,194
Claims priority, application United Kingdom, Apr. 28, 1981, 1000206
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2



269,722
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Herpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,195
Claims priority, application United Kingdom, May 28, 1981, 1000715
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2

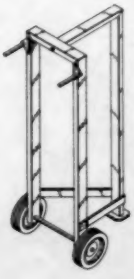


269,723
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Jun. 3, 1981, Ser. No. 270,196
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—2

269,724
TWIN BLADE RAZOR
David O. Chase, and Martin Maloney, both of Skaneateles, N.Y., assignors to American Safety Razor Company, Verona, Va.
Filed Jun. 16, 1980, Ser. No. 159,726
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

269,725
LITTER BIN
Brian G. Cooke, Templestowe, and James R. Burgin, East Brighton, both of Australia, assignors to Overseas Corporation, Australia
Filed Dec. 2, 1980, Ser. No. 212,161
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D34—06

269,726
FIREPLACE WOOD CARRIER
Arlen Skille, Hayward, Wis., assignor to Bill Johnson and Gary Rogstad, both of Hayward, Wis.
Filed Oct. 8, 1980, Ser. No. 194,970
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24



269,727

SHEET OF PLASTIC MATERIAL

Jarl-Erik Jofs, Vaasa, Finland, assignor to Oy Wilk & Höglund Ab, Finland

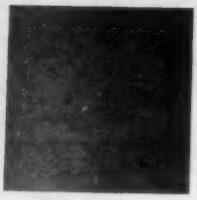
Continuation-in-part of Ser. No. 926,295, Jul. 20, 1978, abandoned. This application Dec. 11, 1980, Ser. No. 215,422

Claims priority, application Finland, Jan. 20, 1978, 44/78

Term of patent 14 years

Int. Cl. D05—*06*

U.S. Cl. D92—1.1



269,728

BRACKET FOR COIN CHANGE HOLDER

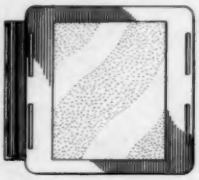
Charles Ohanian, 16 Whites Pl., Watertown, Mass. 02172

Filed Jan. 14, 1981, Ser. No. 225,057

Term of patent 14 years

Int. Cl. D31—*00*

U.S. Cl. D99—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JULY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. T. Ramot Plastics, Ltd.: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,392,960, Cl. 210-651.000.

AB Bofors Elektronik: *See*—
Lundborg, Olle G., 4,392,537, Cl. 177-134.000.

AB Volvo: *See*—
Backman, Erik, 4,392,605, Cl. 229-19.000.

Abbott Laboratories: *See*—
Elias, Allen M.; and Genese, Joseph N., 4,392,850, Cl. 604-82.000.
Elias, Allen M., 4,392,851, Cl. 604-82.000.

Abe, Kunihiro: *See*—
Omori, Toshiyuki; and Abe, Kunihiro, 4,392,951, Cl. 209-307.000.

Abel, Martin L., to Permawick Bearing Corporation. Cartridge bearing assembly. 4,392,753, Cl. 384-136.000.

Abiko, Toshio: *See*—
Minakuchi, Yoshikazu; Abiko, Toshio; and Inoue, Hiromitsu, 4,393,514, Cl. 455-336.000.

ACF Industries, Incorporated: *See*—
Baker, Thomas B.; and Mandrell, Richard J., 4,392,575, Cl. 213-76.000.

Action Instruments Co. Inc.: *See*—
Looper, Norman G., 4,393,347, Cl. 324-126.000.

Adamczyk, Rudolph A., to Titeflex Corporation. End fittings for flexible hoses. 4,392,678, Cl. 285-256.000.

Addison, William C.: *See*—
Hauk, Ernest D.; and Addison, William C., 4,392,527, Cl. 166-55.200.

Aden, David P.: *See*—
Knowles, Barbara B.; and Aden, David P., 4,393,133, Cl. 435-6.000.

Adler, Robert, to Extel Corporation. Magnetic dot matrix printing method and apparatus. 4,392,754, Cl. 400-119.000.

Advanced Card Systems, Ltd.: *See*—
Hofmann, Rolf L., 4,393,302, Cl. 235-474.000.

Advanced Micro Devices, Inc.: *See*—
New, Bernard J., 4,393,457, Cl. 364-726.000.
New, Bernard J., 4,393,468, Cl. 364-736.000.

Aeroquip Corporation: *See*—
Crissy, Charles F.; and Holmes, Paul M., 4,392,762, Cl. 410-116.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Schenk, Gunther; Bergthaller, Peter; Wolfrum, Gerhard; and Stolzenburg, Rudolf, 4,393,132, Cl. 430-562.000.

Ahn, Byorg R. Preliminary heating apparatus for torch lamp. 4,392,819, Cl. 431-231.000.

Aiba, Yasuaki, to Honda Giken Kogyo Kabushiki Kaisha. Device for preventing displacement of an engine in a motorcycle. 4,392,542, Cl. 180-228.000.

Aiken, John A., Jr., to International Business Machines Corporation. Insertion of character set change codes in an altered text stream. 4,393,463, Cl. 364-900.000.

Air Products and Chemicals, Inc.: *See*—
Daniels, Wiley E.; and Nagy, Dennis J., 4,393,173, Cl. 525-329.400.

Aisin Seiki Kabushiki Kaisha: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, 4,393,467, Cl. 364-424.100.
Nakasu, Kei; Ichikawa, Shigeru; Tanaka, Toshihiko; and Ikeda, Mitsuo, 4,392,560, Cl. 188-73.340.

Aisin-Warner Kabushiki Kaisha: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, 4,393,467, Cl. 364-424.100.

Ajinomoto Company Incorporated: *See*—
Tsuchida, Takayasu; and Nakamori, Shigeru, 4,393,135, Cl. 435-110.000.

Akagi, Kazuo: *See*—
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,267, Cl. 15-88.000.
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,506, Cl. 134-46.000.

Akiyama, Hiroyuki; Hatakeyama, Hideo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, to Japan Styrene Paper Corporation. Process for producing plate-like polystyrene resin foam. 4,393,016, Cl. 264-53.000.

Akzo NV: *See*—
Zengel, Hans-Georg; and Bergfeld, Manfred, 4,393,238, Cl. 564-255.000.

Alaimo, Robert J., to Norwich Eaton Pharmaceuticals, Inc. 5-Methyl-2-trifluoromethylindolo[2,3-b]quinoxaline. 4,393,208, Cl. 544-343.000.

Albrecht, Allan J.; and Van Ooyen, Richard C., to J. I. Case Company. Boom and dipper stick constructioe. 4,392,314, Cl. 37-103.000.

Albright, Jay D.: *See*—
Dusza, John P.; and Albright, Jay D., 4,393,217, Cl. 548-362.000.

Alder, Hanspeter; and Schalch, Eugen, to Swiss Aluminium Ltd. Electrode arrangement in a cell for manufacture of aluminum from molten salts. 4,392,925, Cl. 204-67.000.

Alexander, A. Gordon, to Exxon Research and Engineering Co. Process for continuously manufacturing lubricating grease. 4,392,967, Cl. 252-41.000.

Allen, Harry R., to Upjohn Company, The. Method of treating cardiac arrhythmia. 4,393,054, Cl. 424-180.000.

Allen, John K.; and Lammers, Gerard C., to Standard Oil Company (Indiana). Continuous non-catalytic pyrolysis of aqueous slurry of oxygen-containing derivatives of benzene and toluene. 4,393,264, Cl. 585-469.000.

Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; Stacy, Robert A.; and Meyer, Danny D., to McDonnell Douglas Corporation. Laser diode with double sided heat sink. 4,393,393, Cl. 357-81.000.

Allen, Robert P., to Eastman Kodak Company. Hydrocarbon resin and process for preparation. 4,393,261, Cl. 585-422.000.

Allen, Roy A., to Shell Oil Company. Polyfunctional phenolic-melamine epoxy resin curing agents. 4,393,181, Cl. 525-504.000.

Allied Corporation: *See*—
Elsenbaumer, Ronald L.; and Wasserman, Edel, 4,392,978, Cl. 252-182.000.
Reimschuessel, Herbert K.; and DeBona, Bruce T., 4,393,233, Cl. 562-473.000.
Rogic, Milorad M.; and Oxenrider, Bryce C., 4,393,215, Cl. 548-125.000.
Stables, Wilbur L.; Pendlebury, David; Saich, Anthony M.; and Hamlyn, Maxwell C., 4,392,285, Cl. 28-276.000.

Almlof, Goran; and Hagqvist, Peter. Combustion process with waste gas purification. 4,392,871, Cl. 55-23.000.

Almor Corporation: *See*—
Foster, Stephen W., 4,392,553, Cl. 186-61.000.

Aloi, Michael J.; and Hancock, Kevin J., II. Built-in solar panel. 4,392,484, Cl. 126-450.000.

Alpine Research, Inc.: *See*—
Ramer, Paul C., 4,392,666, Cl. 280-614.000.

Alps Electric Co., Ltd.: *See*—
Sugiura, Shigekata; and Kanno, Susumu, 4,393,436, Cl. 361-380.000.

Altenschopfer, Theodor; and Schumann, Klaus, to Henkel Kommanditgesellschaft Auf Aktien. Liquid cleaning and maintenance composition especially for dishwashers. 4,392,977, Cl. 252-174.190.

Aluminum Company of America: *See*—
Eckert, Charles E.; and Miller, Ronald E., 4,392,888, Cl. 75-68.00R.

Alvey Inc.: *See*—
Turnbough, Harold L.; and Werntz, Charles W., 4,392,568, Cl. 198-781.000.

Amano, Hiroyuki: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, 4,393,467, Cl. 364-424.100.

American Cyanamid Company: *See*—
Dusza, John P.; and Albright, Jay D., 4,393,217, Cl. 548-362.000.
Giglia, Robert D.; and Haacke, Gottfried, 4,392,721, Cl. 350-357.000.
Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, 4,393,055, Cl. 424-180.000.
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,393,004, Cl. 260-245.500.

American Hoechst Corporation: *See*—
Amtower, Richard E., 4,393,411, Cl. 358-302.000.

American Medical Systems, Inc.: *See*—
Burton, John H.; and Mikulich, Michael A., 4,392,562, Cl. 128-79.000.

American Microsystems, Inc.: *See*—
Gregorian, Roubik; and Wegner, Glenn, 4,393,351, Cl. 328-127.000.

American Monitor Corporation: *See*—
Stephens, Thomas W., 4,393,142, Cl. 436-125.000.

American Standard Inc.: *See*—
Pascoe, Robert D., 4,392,626, Cl. 246-34.00R.

Amodeo, Ralph J.: *See*—
Volpe, Gerald T.; Laskoski, Leonard S.; Amodeo, Ralph J.; Swanson, William J.; and Gottesman, Jerome D., 4,393,352, Cl. 329-50.000.

Amoroso, Michael J. Portable rescue tool. 4,392,263, Cl. 7-100.000.

AMP Incorporated: *See*—
Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., 4,392,705, Cl. 339-75.0MP.
Baker, Robert W.; Owen, Leonard J.; and Simmons, Reginald J., 4,392,706, Cl. 339-91.00R.
Billman, Timothy B.; and Kautz, Jon F., 4,392,300, Cl. 29-739.000.
Showman, Robert L.; and Weber, Robert N., 4,392,700, Cl. 339-17.00M.
Weidler, Charles H., 4,392,701, Cl. 339-17.00R.

Ampex Corporation: *See*—
Svendsen, Gordon D., 4,393,301, Cl. 377-56.000.

Amtower, Richard E., to American Hoechst Corporation. Laser read-write system for the production of engravings. 4,393,411, Cl. 358-302.000.

Anaconda-Ericsson: *See*—
Ashlock, Robert L.; Gabrielson, Carl E.; Kerr, Douglas P.; Rasmussen, David J.; Stump, Theodore M.; and Thode, Charles W., 4,393,491, Cl. 370-13.000.

Anchor Hocking Corporation: *See*—
Ochs, Charles S., 4,392,580, Cl. 215-332.000.

Anderson, David N.: *See*—
Cross, Stephen D.; Frost, Elmer F., Jr.; and Anderson, David N., 4,392,803, Cl. 425-126.00S.

Anderson, Gordon K., to Carrier Corporation. Permanent magnet rotor. 4,393,320, Cl. 310-156.000.

Anderson, James E.; Lee, John D.; and Livermore, Frederick C., to Northern Telecom Limited. Overvoltage protector for telephone lines. 4,393,433, Cl. 361-119.000.

Anderson, Raymond A. Quick release wheel mount. 4,392,690, Cl. 301-121.000.

Anderson, Richard D., to Pako Corporation. Disc film advance assembly. 4,392,743, Cl. 355-75.000.

Andersson, Lars G. High stability trimaran. 4,392,444, Cl. 114-39.000.

Andrew, Wesley A.: *See*—
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,393,350, Cl. 324-334.000.

Andrews, Christopher M., to Ciba-Geigy Corporation. Curing agents for epoxide resins and compositions containing them. 4,393,180, Cl. 525-504.000.

Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., to AMP Incorporated. Zero insertion force connector system. 4,392,705, Cl. 339-75.0MP.

Angelbeck, Albert W.; and Palma, Gary E., to United Technologies Corporation. Cavity length control system for a multiline HEL. 4,393,503, Cl. 372-20.000.

Anger, Klaus; Frosien, Juergen; Lischke, Burkhard; Plies, Erich; and Tonar, Klaus, to Siemens Aktiengesellschaft. High current electron source. 4,393,308, Cl. 250-396.00R.

Angersbach, Wolfgang; and Meier, Karl-Heinz, to Quick-Rotan Elektromotoren GmbH. Position adjusting drive unit. 4,393,343, Cl. 318-640.000.

Angus Chemical Company: *See*—
Eckler, Paul E., 4,393,149, Cl. 521-129.000.

Anic, S.p.A.: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; and Brunelli, Maurizio, 4,393,218, Cl. 548-530.000.

Anorad Corporation: *See*—
Chitayat, Anwar, 4,392,642, Cl. 269-73.000.

Anstotz, Helmut; Kubik, Klaus; and Paulussen, Heinz, to Kusters, Eduard. Device for action on webs of material with at least one cylinder. 4,392,288, Cl. 29-116.0AD.

Aoki, Kenji; Goto, Mitsuhiro; and Miura, Teiji, to Kabushiki Kaisha Suwa Seikosha. Electrostatic printer. 4,393,390, Cl. 346-155.000.

Aoyama, Keizo: *See*—
Shimada, Hiroshi; and Aoyama, Keizo, 4,393,472, Cl. 365-190.000.

Apuzzo, Gennaro, to Merisinter S.p.A. Press for pulverulent materials. 4,392,800, Cl. 425-78.000.

Arai, Katsuhiko: *See*—
Kaneda, Hiroshi; Arai, Katsuhiko; Suzuki, Akira; and Ohashi, Takashi, 4,393,015, Cl. 264-51.000.

Arai, Takao; Hoshino, Takashi; and Kobayashi, Masaharu, to Hitachi, Ltd. Synchronizing signal detection protective circuit. 4,393,419, Cl. 360-37.100.

Arakawa, Kaneyasu; and Mizuno, Shigeo, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Electrical switch structure. 4,393,360, Cl. 335-164.000.

Aranykalasz Mgtsz: *See*—
Plesa, Laszlo, 4,392,304, Cl. 30-178.000.

Arbed S.A.: *See*—
Goedert, Jean, 4,392,887, Cl. 75-58.000.

Arcamone, Federico: *See*—
Bargiotti, Alberto; Cassinelli, Giuseppe; Penco, Sergio; Arcamone, Federico; and Casazza, Annamaria, 4,393,052, Cl. 424-180.000.

Ark-les Corporation: *See*—
Walkup, William B., 4,392,702, Cl. 339-19.000.

Arkwin Industries, Inc.: *See*—
Deutsch, Edward J., 4,392,556, Cl. 188-67.000.

Armand, Marcel, to Pechiney Ugine Kuhlmann. Process for controlling the permeability of diaphragms in the preparation of polyvalent metals by electrolysis and an electrolysis cell for carrying out the process. 4,392,924, Cl. 204-64.00T.

Armco Inc.: *See*—
Graff, Hart F.; and Bagdal, Karl T., 4,392,613, Cl. 239-115.000.

Armstrong World Industries, Inc.: *See*—
Hoyle, Charles E.; and Lenox, Ronald S., 4,393,006, Cl. 260-349.000.
Kaufmann, John C.; and Lenox, Ronald S., 4,392,863, Cl. 8-400.000.

Arneklev, Duane R.: *See*—
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,392,884, Cl. 71-100.000.

Arnold, Ann A.: *See*—
Swett, James B.; and Arnold, Ann A., 4,392,594, Cl. 222-530.000.

Arnold, Herbert: *See*—
Gunther, Dieter; Bertsch, Richard; Bottcher, Siegfried; Arnold, Herbert; Schnurle, Hans; and Horbelt, Michael, 4,392,470, Cl. 123-440.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hayashi, Hiroshi; Shimojima, Yukiji; Shirai, Takashi; Ishida, Torao; and Shibukawa, Mitsuru, 4,393,225, Cl. 549-289.000.

Asahi, Naotatsu: *See*—
Kanamaru, Hisanobu; Tohkairin, Akira; Tatsumi, Hideo; Asahi, Naotatsu; and Haginoya, Mitsuo, 4,392,296, Cl. 29-520.000.

Asao, Akihide: *See*—
Du, Nguyen T.; and Asao, Akihide, 4,392,893, Cl. 148-1.500.
Du, Nguyen T.; and Asao, Akihide, 4,393,479, Cl. 365-218.000.

Asayama, Yoshiaki: *See*—
Okuda, Kuniteru; Fukami, Teruki; Asayama, Yoshiaki; Wada, Shunichi; and Kabuto, Masami, 4,392,385, Cl. 73-861.230.

Ashby, Richard L. Ligature tying instrument. 4,392,494, Cl. 128-326.000.

Ashland Oil, Inc.: *See*—
Garrett, William R., Jr., 4,393,155, Cl. 524-60.000.
Smith, Norman L., 4,393,034, Cl. 423-450.000.

Ashlock, Robert L.; Gabrielson, Carl E.; Kerr, Douglas P.; Rasmussen, David J.; Stump, Theodore M.; and Thode, Charles W., to Anaconda-Ericsson. Automatic self-test system for a digital multiplexed telecommunication system. 4,393,491, Cl. 370-13.000.

Asonen, Osmo: *See*—
Niinivaara, Juhani, 4,393,297, Cl. 219-137.00R.

Astro-Steel Grip International, Inc.: *See*—
Heiman, Robert B., 4,392,335, Cl. 52-309.170.

Atlantic Richfield Company: *See*—
Sun, Hsiang-ning; Leonard, John J.; and Shalit, Harold, 4,393,038, Cl. 423-584.000.

Aucktor, Erich, to Lohr & Bromkamp GmbH. Drive shaft construction. 4,392,839, Cl. 464-183.000.

Audeh, Costandi A.; and Greco, Saverio G., to Mobil Oil Corporation. Integrated refining process. 4,392,947, Cl. 208-229.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Ruf, Max, 4,392,797, Cl. 418-91.000.

Austin, Richard G.: *See*—
Michaelson, Robert C.; and Austin, Richard G., 4,393,253, Cl. 568-860.000.

Australasian Training Aids Pty. Ltd.: *See*—
Knight, Lindsay C.; and Cottis, Robert A., 4,392,652, Cl. 273-358.000.

Automa S.p.A.: *See*—
Bortolotti, Andrea; and Bettucchi, Mauro, 4,392,802, Cl. 425-107.000.

Automatic Rollers Doors Australia Pty., Ltd.: *See*—
Perisic, Milan; Lumbers, Warwick J.; and Bone, John A., 4,392,392, Cl. 74-626.000.

Automation Industries, Inc.: *See*—
Timmons, David R., 4,392,283, Cl. 24-255.0SL.

Avery, Don E. Pump control system for windmills. 4,392,785, Cl. 417-218.000.

Avery International Corporation: *See*—
Reed, Charles F.; and Morrow, Charles M., 4,392,585, Cl. 221-1.000.

Axel Johnson Engineering AB: *See*—
Hakansson, Sven, 4,392,422, Cl. 100-118.000.

Ayano, Satoshi: *See*—
Gaku, Morio; Ikeguchi, Nobuyuki; and Ayano, Satoshi, 4,393,195, Cl. 528-361.000.

B. F. Goodrich Company, The: *See*—
Kim, Hueng T.; and Nehmey, Sam D., 4,393,017, Cl. 264-53.000.
Martindale, Troy E., Jr., 4,392,403, Cl. 83-418.000.

Baba, Takaaki: *See*—
Ikushima, Hiroshi; Baba, Takaaki; Sagishima, Takayuki; and Tanaka, Masanobu, 4,393,400, Cl. 358-92.000.

Babcock Textilmaschinen GmbH: *See*—
Schrader, Alfons; and Schreiner, Waldemar, 4,392,309, Cl. 34-54.000.

Bachman, Wesley J.; and Funk, Robert C., to Dickey-john Corporation. Sprayer control system. 4,392,611, Cl. 239-74.000.

Backman, Erik, to AB Volvo. Package. 4,392,605, Cl. 229-19.000.

Bada, Hajime: *See*—
Kodaka, Mikio; Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, 4,392,886, Cl. 75-52.000.

Bagdal, Karl T.: *See*—
Graff, Hart F.; and Bagdal, Karl T., 4,392,613, Cl. 239-115.000.

Bagdasarian, Alexandr S.; Gulyaev, Jury V.; Fedorets, Vladimir N.; and Kmita, Anatoly M. Surface acoustic wave transducer. 4,393,321, Cl. 310-313.00B.

Bailey, Gary C., to Engineering Development Company. Speaker enclosure and method of producing same. 4,392,548, Cl. 181-156.000.

Bailey, James R.; and Lutzenberger, Kurt, to Switchcraft, Inc. Electrical jack. 4,392,708, Cl. 339-182.00R.

Bailey, Thomas: *See*—
Mitchell, Alan; and Bailey, Thomas, 4,393,235, Cl. 562-478.000.

Bains, Kuldip: *See*—
Evans, John L.; and Bains, Kuldip, 4,392,618, Cl. 239-461.000.

Baker International Corporation: *See*—
Redden, Raymond L., 4,393,485, Cl. 367-25.000.

Baker, Lawrence K. Hearing aid earmolds. 4,392,547, Cl. 181-135.000.

Baker, Robert W.; Owen, Leonard J.; and Simmons, Reginald J., to AMP Incorporated. Electrical connector with latching means. 4,392,706, Cl. 339-91.00R.

Baker, Thomas B.; and Mandrell, Richard J., to ACF Industries, Incorporated. Swivel assembly for end cock. 4,392,575, Cl. 213-76.000.

Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Redpath, Diane L., to International Business Machines Corporation. Spray head apparatus. 4,392,617, Cl. 239-290.000.

Bald, Wilfried, to Schloemann-Siemag Aktiengesellschaft. Process and apparatus for the rolling of strip metal. 4,392,367, Cl. 72-12.000.

Baldwin, John J.; and Posticello, Gerald S., to Merck & Co., Inc. Certain nicotinic acid esters and corresponding nicotinonitriles. 4,393,212, Cl. 546-286.000.

Bandelj, Bojan, to ISKRA-SOZD elektrokovinske industrije n.sol.o. Low power siren. 4,393,374, Cl. 340-405.000.

Bar, Alfredo, to Necchi Societa per Azioni. Hermetically sealed motor-compressor unit for refrigerators. 4,392,789, Cl. 417-312.000.

Barchard, John, to Spyder Sales & Service, Inc. Vehicle convertible from a tricycle two wheel drive to a four wheel four wheel drive. 4,392,541, Cl. 180-209.000.

Baret, Jean-Luc A. G., to Corning Glass Works. Method for disinfecting immobilized enzymes. 4,393,138, Cl. 435-176.000.

Bargiotti, Alberto; Cassinelli, Giuseppe; Penco, Sergio; Arcamone, Federico; and Casazza, Annamaria, to Farmitalia Carlo Erba S.p.A. Antitumor anthracycline glycosides, their preparation, intermediates therefor, and compositions and use thereof. 4,393,052, Cl. 424-180.000.

Bargues, Denis: *See*—
Beck, Jean L.; le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, 4,393,408, Cl. 358-205.000.

Barker, John C.; and McLaughlin, Ivan P., to J. J. Barker Company Limited. Simulated ceramic tile. 4,393,108, Cl. 428-44.000.

Barker, Leland W., to Eastman Kodak Company. Method and apparatus for measuring total liquid volume flow. 4,393,451, Cl. 364-510.000.

Barker, Robert A.; and Ong, Edith C., to Bell Telephone Laboratories, Incorporated. Integrated circuit device connection process. 4,392,298, Cl. 29-577.00C.

Barnes, Michael F.: *See*—
Metz, Joseph R.; and Barnes, Michael F., 4,392,281, Cl. 24-230.50R.

Barnes, Walter P.; and Emilio, Carlo, Jr. Beehive clamping and transfer device. 4,392,679, Cl. 294-15.000.

Barnhart, Steven G.: *See*—
Walters, John P.; and Barnhart, Steven G., 4,393,327, Cl. 315-241.00R.

Barton, Dale S.; and Heck, Richard M., to Riise Engineering Company, Inc. Angle stacking and inverting device. 4,392,765, Cl. 414-30.000.

BASF Aktiengesellschaft: *See*—
Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, 4,393,251, Cl. 568-811.000.
Davis, Robert E., 4,392,456, Cl. 123-1.00A.
Engelbach, Heinz; Steigleiter, Werner; and Glietenberg, Helmut, 4,392,984, Cl. 252-432.000.
Hoffman, Werner; von Fraunberg, Karl; and Baumann, Manfred, 4,393,245, Cl. 568-375.000.
Hummerich, Rainer; Weiss, Wolfram; Merger, Franz; Immel, Guenther; Kraus, Hans-Joachim; and Peters, Karl-Clemens, 4,393,207, Cl. 544-196.000.
McKee, Graham E.; Haaf, Franz; Hambrecht, Juergen; Benker, Klaus; Stephan, Rudolf; and Breuer, Hans, 4,393,164, Cl. 525-83.000.
Patsch, Manfred; Ruske, Manfred; and Hahn, Erwin, 4,393,005, Cl. 260-245.730.
Tonne, Peter; and Jaedicke, Hagen, 4,393,211, Cl. 546-153.000.

BASF Farben & Fasern A.G.: *See*—
Hoppe, Karl; and Strauss, Udo, 4,393,179, Cl. 525-490.000.

Basotherm GmbH: *See*—
Hofmann-Igl, Ernest, 4,392,590, Cl. 222-174.000.

Bassi, Alberto, to ITW Fastex Italia S.p.A. Retractable ashtray, particularly for motor vehicles. 4,392,683, Cl. 296-37.900.

Battelle-Institut e.V.: *See*—
Schlueter, Gert; and Schuster, Wilhelm, 4,393,141, Cl. 436-63.000.

Battista, Orlando A. Ultra high-foam dentifrice. 4,393,042, Cl. 424-49.000.

Bauch, Ludwig. Apparatus for removing a tube core from and inserting same into a heat exchanger. 4,392,524, Cl. 165-76.000.

Bauer Bros. Co., The: *See*—
Beery, James P., 4,392,950, Cl. 209-211.000.

Bauer, Ludwig, to Daimler-Benz Aktiengesellschaft. Vent cap for a container accommodating hydraulic fluids. 4,392,584, Cl. 220-374.000.

Bauer, Rudolf: *See*—
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mierau, Joachim, 4,393,069, Cl. 424-265.000.

Bauerle, James E., to Westinghouse Electric Corp. Gas sampler for aerosol atmosphere. 4,392,388, Cl. 73-863.230.

Bauerlen, Hans; Pfendler, Thomas; and Wocher, Berthold, to Robert Bosch GmbH. Distance-frequency transducer. 4,392,383, Cl. 73-724.000.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,392,961, Cl. 210-679.000.
Lee, John M.; and Bauman, William C., 4,392,979, Cl. 252-184.000.
Lee, John M.; and Bauman, William C., 4,392,980, Cl. 252-184.000.

Baumann, Manfred: *See*—
Hoffman, Werner; von Fraunberg, Karl; and Baumann, Manfred, 4,393,245, Cl. 568-375.000.

Baumli, Peter J. Labelling apparatus. 4,392,913, Cl. 156-584.000.

Bayer Aktiengesellschaft: *See*—
Blank, Heinz U.; Gabel, Eike; Goldschmitt, Ernst; and Mentzel, Werner, 4,393,234, Cl. 562-475.000.
Freitag, Dieter; Bottenbruch, Ludwig; and Wulff, Claus, 4,393,009, Cl. 260-544.00K.
Kuhlthau, Hans-Peter, 4,392,998, Cl. 260-146.00R.
Lindner, Christian; Ott, Karl-Heinz; and Pischtschan, Alfred, 4,393,172, Cl. 525-310.000.
Maurer, Fritz, 4,393,232, Cl. 562-419.000.
Reischl, Artur; and Wagner, Kuno, 4,393,166, Cl. 525-27.000.
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,392,882, Cl. 71-92.000.
Schutt, Hermann, 4,393,140, Cl. 435-226.000.
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; and Zeiler, Hans-Joachim, 4,393,051, Cl. 424-180.000.
Uhrhan, Paul; and Krauthausen, Edmund, 4,393,206, Cl. 544-51.000.

Bayers, Jon. H. Apparatus for and method of suturing tissue. 4,392,495, Cl. 128-334.00R.

Baylis, Francis P.; and Smith, Gary E., to Merck & Co., Inc. Combination of thiopeptin and other related sulfur-containing cyclic polypeptide antibiotics with rumen-active diimides to improve ruminant feed efficiency. 4,393,046, Cl. 424-117.000.

Bazin, Lucas J.: *See*—
Hacke, Joseph F.; and Bazin, Lucas J., 4,393,395, Cl. 358-23.000.

BBC Brown, Boveri & Company Limited: *See*—
Schwarzenbach, Alfred, 4,392,354, Cl. 60-727.000.

Bears, John D.; and Emery, Kenneth R. D., to Ener-Tech Heating Systems Inc. Oil burner. 4,392,810, Cl. 431-37.000.

Beck, Jean L.; le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, to Thomson-CSF. Optoelectronic device for rotary scanning of videofrequency images. 4,393,408, Cl. 358-205.000.

Beck, Martin H.: *See*—
Pushee, Joan C.; Harry, Ieuan L.; Beck, Martin H.; and Krishnakumar, Suppayan M., 4,392,804, Cl. 425-174.80E.

Beecham Group Limited: *See*—
Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., 4,393,079, Cl. 424-331.000.

Beer, Hans: *See*—
Perl, Horst; Nussbaumer, Dietmar; Kluver, Horst; and Beer, Hans, 4,392,963, Cl. 210-692.000.

Beer, Herbert, to Steifemand Sitzmobel- und Tischfabrik, Inh. Adjustable office chair. 4,392,686, Cl. 297-376.000.

Beery, James P., to Bauer Bros. Co., The. Centrifugal type cleaner. 4,392,950, Cl. 209-211.000.

Beeson, John M.: *See*—
Jameson, James J.; and Beeson, John M., 4,392,391, Cl. 74-333.000.

Behnke, Jurgen: *See*—
Eckstein, Wolfgang; Rabenecker, Horst; and Behnke, Jurgen, 4,392,389, Cl. 73-864.910.

Beisswenger, Siegfried; Boppel, Wolfgang; and Grieger, Dieter, to Ing. Rudolf Hell GmbH. Apparatus and method for engraving with an electron beam. 4,393,295, Cl. 219-121.0EJ.

Belforte, Piero; and Bortignon, Renzo, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Transceiver for full-duplex transmission of digital signals over a common line. 4,393,494, Cl. 370-27.000.

Bell, Melvyn R.; and Thomson, Charles D., to Ferranti Limited. Cooling means for circuit assemblies each including hollow structures spaced apart in a container. 4,393,437, Cl. 361-383.000.

Bell Telephone Laboratories, Incorporated: *See*—
Barker, Robert A.; and Ong, Edith C., 4,392,298, Cl. 29-577.00C.
Briley, Bruce E., 4,393,518, Cl. 455-617.000.
Cantwell, Richard F., Jr., 4,393,497, Cl. 370-89.000.
Collier, Robert J.; and Thomson, Michael G. R., 4,393,312, Cl. 250-492.200.
Feldman, Leonard C.; Kraus, Joseph S.; Tolk, Norman H.; Traum, Morton M.; and Tully, John C., 4,393,311, Cl. 250-459.100.
Klein, Theodore H., 4,393,111, Cl. 428-195.000.
Marshall, Thomas G., Jr., 4,393,456, Cl. 364-724.000.
Steele, Raymond, 4,393,276, Cl. 179-1.50R.

Beller, Manfred; and Wiedenmann, Hans, to Wieland-Werke A.G., Metallwerke. Process and apparatus for controlling the level of a molten metal surface in continuous casting moulds. 4,392,523, Cl. 164-453.000.

Belt, James S.: *See*—
Takeuchi, Kunthiko; and Belt, James S., 4,392,879, Cl. 65-6.000.

Beltone Electronics Corporation: *See*—
Feldman, Stanley; and Koch, Gary, 4,393,275, Cl. 179-1.0VL.

Belttary, Harold E., to GTE Products Corporation. Circuit breaker. 4,393,288, Cl. 200-144.00R.

Ben Clements & Sons, Inc.: *See*—
Hara, Saburo, 4,392,906, Cl. 156-250.000.

Bendix Corporation, The: *See*—
Hall, James R.; and Whallon, William P., Jr., 4,392,703, Cl. 339-49.00R.

Bengal, Inc.: *See*—
Lybrand, William, 4,393,159, Cl. 524-243.000.
Lybrand, William, 4,393,176, Cl. 525-379.000.

Benker, Klaus: *See*—
McKee, Graham E.; Haaf, Franz; Hambrecht, Juergen; Benker, Klaus; Stephan, Rudolf; and Breuer, Hans, 4,393,164, Cl. 525-83.000.

Bensen, Court. Flushing apparatus with selective quantity control. 4,392,260, Cl. 4-324.000.

Benson, Clark K.: *See*—
Caridis, Andrew A.; and Benson, Clark K., 4,392,420, Cl. 99-406.000.

Beppu, Norio; and Fujii, Akira, to Minolta Camera Kabushiki Kaisha. Intervals timer for cameras. 4,392,733, Cl. 354-266.000.

Beran, Anthony V. Tube holder. 4,392,857, Cl. 604-179.000.

Berger, Norbert: *See*—
Fussl, Erwin; and Berger, Norbert, 4,392,821, Cl. 432-96.000.

Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., to Reseal Container Corporation of America, The. Multilayered container including a layer of microcrimped metallic foil. 4,392,576, Cl. 215-1.00C.

Bergeron, Gaetan G. Scaffolding arrangement. 4,392,550, Cl. 182-82.000.

Bergfeld, Manfred: *See*—
Zengel, Hans-Georg; and Bergfeld, Manfred, 4,393,238, Cl. 564-255.000.

Bergthaller, Peter: *See*—
Schenk, Gunther; Bergthaller, Peter; Wolfrum, Gerhard; and Stolzenburg, Rudolf, 4,393,132, Cl. 430-562.000.

Berlie, Elmer M.; and Smart, John D., to Western Research and Development. Waste gas incinerator. 4,392,816, Cl. 431-202.000.

Berlie, Elmer M.; Smart, John D.; and Zelensky, Michael J., to Western Research & Development. Waste gas incinerator with added fuel gas. 4,392,817, Cl. 431-202.000.

Berlivet, Marc A.; and Guerineau, Abel A. J., to Hesston Corporation. Crop windrowing machine having double windrow-forming attachment. 4,392,339, Cl. 56-192.000.

Bernard, Walter. Bicycle storage rack. 4,392,572, Cl. 211-19.000.

Berner, Godwin; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Thermally polymerizable mixtures and processes for the thermally-initiated polymerization of cationically polymerizable compounds. 4,393,185, Cl. 528-27.000.

Bernsau, Peter: *See*—
Bohn, Hans; Stein, Wolfgang; Bernsau, Peter; and Staubitzer, Fred, 4,392,909, Cl. 156-306.900.

Bernstein, Seymour: *See*—
Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, 4,393,055, Cl. 424-180.000.

Berting, John P.; and Kroeger, James K. Non-multiplexed LCD drive circuit. 4,393,379, Cl. 340-784.000.

Bertoldo, Giorgio, to Societa Pneumatici Pirelli S.p.A. Process and apparatus for manufacturing vehicle tires. 4,392,899, Cl. 156-127.000.

Bertsch, Richard: *See*—
Gunther, Dieter; Bertsch, Richard; Bottcher, Siegfried; Arnold, Herbert; Schnurle, Hans; and Horbelt, Michael, 4,392,470, Cl. 123-440.000.

Bertschinger, Hans; and Scherler, Alfred, to Locher & Cie. AG; and Cellulose Attisholz AG. Sewage ventilating basin. 4,392,954, Cl. 210-195.300.

Besen, Peter D.; Shulsinger, Don H.; and Goldberg, Stuart D., to Selectastation, Inc. Remote tuner control system. 4,393,277, Cl. 179-2.00A.

Bettucchi, Mauro: *See*—
Bortolotti, Andrea; and Bettucchi, Mauro, 4,392,802, Cl. 425-107.000.

Bhaduri, Sumit; and Mahandru, Madan M., to Indian Explosives Limited. Method and the manufacture of cyclic mono and/or diketones from cyclic mono or sesqui terpenes by catalytic oxidation. 4,393,244, Cl. 568-360.000.

Biebuyck, Jean-Jacques E. R. G.: *See*—
Legras, Roger M. H.; Biebuyck, Jean-Jacques E. R. G.; and Mercier, Jean P., 4,393,178, Cl. 525-437.000.

Bigorajski, Gunter: *See*—
Eisenberg, Gustav; and Bigorajski, Gunter, 4,393,021, Cl. 264-143.000.

Biller, Efim, to Elprochine AG. Process for the preparation of polyaryl amines having methylene bridges. 4,393,239, Cl. 564-331.000.

Billett, Ronald J.; and Viitanen, Veikko K., to FMC Corporation. Apparatus for making pallets. 4,392,600, Cl. 227-50.000.

Billman, Timothy B.; and Kautz, Jon F., to AMP Incorporated. Applicator tool for loose miniature spring sockets. 4,392,300, Cl. 29-739.000.

Billman, Timothy B.: *See*—
Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., 4,392,705, Cl. 339-75.0MP.

Bilow, Norman, to United States of America, Air Force. Diethynylbenzene-ethynylpyrene copolymers. 4,393,101, Cl. 427-228.000.

Binder, Kurt: *See*—
Gast, Theodor; and Binder, Kurt, 4,392,632, Cl. 251-65.000.

Binet, Daniel: *See*—
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dang Vu, Quang, 4,393,151, Cl. 523-130.000.

Binks Industries, Inc.: *See*—
Calkins, James D.; Bushong, Eugene E.; and Schuck, Lee R., 4,393,313, Cl. 250-560.000.

Bio Clinic Company: *See*—
Wagner, Bill L., Sr., 4,392,489, Cl. 128-80.00A.

Birkle, Siegfried: *See*—
Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, 4,392,936, Cl. 204-213.000.

Bishop, Larry D., to Reliance Electric Co. Digital subscriber carrier system including drop terminals and bypass and loopback means and alarm indication means. 4,393,492, Cl. 370-15.000.

Bittle, Carl E., to Universal Foods Corporation. Root crop harvester. 4,392,533, Cl. 171-14.000.

Black, Hugh J. Portable heat circulation means. 4,392,478, Cl. 126-84.000.

Blades, Brian J., to Texas Instruments Incorporated. Thermally responsive fluid and electrical switch and control system. 4,392,608, Cl. 236-48.00R.

Blanchard, Richard A., to Supertex, Inc. Power MOS transistor with a plurality of longitudinal grooves to increase channel conducting area. 4,393,391, Cl. 357-23.000.

Blank, Heinz U.; Gabel, Eike; Goldschmitt, Ernst; and Mentzel, Werner, to Bayer Aktiengesellschaft. Process for the preparation of 3-hydroxybenzoic acid. 4,393,234, Cl. 562-475.000.

Bloemers, James L.; Schiek, James M.; Frazzell, Michael E.; and Karls, Michael A., to Brunswick Corporation. Marine drive water pump. 4,392,779, Cl. 415-141.000.

Blume, James W., Sr. Game apparatus. 4,392,653, Cl. 273-400.000.

Blunt, Thomas O., to General Electric Company. Automatic feeding apparatus. 4,392,766, Cl. 414-113.000.

BMC Products: *See*—
Weiler, Raywood C., 4,392,436, Cl. 108-81.000.

Boba, Joseph; and Conger, Robert P., to Congoleum Corporation. Stain resistant, abrasion resistant polyurethane coating composition, substrate coated therewith and production thereof. 4,393,187, Cl. 528-60.000.

Bock, Gustavus P., to General Motors Corporation. Electric motor powered actuator. 4,393,319, Cl. 310-80.000.

Boehringer Mannheim GmbH: *See*—
Schrenk, Jurgen; and Wunderwald, Peter, 4,393,139, Cl. 435-219.000.

Boeing Company, The: *See*—
Jackson, Tee-Squant-Nee; Vernon, Paul M.; and Schoen, David A., 4,393,498, Cl. 371-20.000.
Jones, William R., 4,393,382, Cl. 343-112.00D.
McClaflin, John R., 4,392,622, Cl. 244-102.00A.
Mickelsen, Reid A.; and Chen, Wen S., 4,392,451, Cl. 118-690.000.
Munsen, Victor A.; and McClaflin, John R., 4,392,623, Cl. 244-102.00R.
Sears, Stanley L., 4,392,604, Cl. 228-212.000.

Boguth, Walter; and Hirth, Georges, to Hoffmann-La Roche Inc. Pharmaceutical preparations. 4,393,057, Cl. 424-229.000.

Boguth, Walter; and Hirth, Georges, to Hoffmann-La Roche Inc. Pharmaceutical preparations. 4,393,073, Cl. 424-284.000.

Bohen, Joseph M.: *See*—
Sandler, Stanley R.; and Bohen, Joseph M., 4,393,248, Cl. 568-676.000.

Bohn, Hans; Stein, Wolfgang; Bernsau, Peter; and Staubitzer, Fred, to Robert Burkle GmbH & Co. Method and device for producing multilayer printed circuit boards. 4,392,909, Cl. 156-306.900.

Bolz, Gunner: *See*—
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, 4,393,466, Cl. 364-415.000.

Bonar Horticulture, Ltd.: *See*—
Sanders, Bernard, 4,392,327, Cl. 47-59.000.

Bone, John A.: *See*—
Perisic, Milan; Lumbers, Warwick J.; and Bone, John A., 4,392,392, Cl. 74-626.000.

Bonewitz, Hans-Ulrich; Muhlich, Albert; and Rau, Karlheinz, to Heraeus Quarzschmelze GmbH. Optical fiber. 4,392,715, Cl. 350-96.330.

Bonifaz, Cristobal, to Du Pont de Nemours, E. I., and Company. Light monoolefins from methanol and/or dimethyl ether. 4,393,265, Cl. 585-639.000.

Bonny, Weldon D. Cooking and smoking apparatus. 4,392,419, Cl. 99-339.000.

Booe, James M., Jr. Combination tool for removing and replacing a nut. 4,392,264, Cl. 7-138.000.

Boothman, Edwin F. Sign letter construction. 4,392,317, Cl. 40-618.000.

Boppel, Wolfgang: *See*—
Beisswenger, Siegfried; Boppel, Wolfgang; and Grieger, Dieter, 4,393,295, Cl. 219-121.0EJ.

Borg-Warner Corporation: *See*—
Smit, Geoffrey N., 4,392,843, Cl. 474-245.000.

Boria, Thomas J. Plant shelter. 4,392,326, Cl. 47-28.00R.

Bormann, Dieter: *See*—
Merkel, Wulf; Bormann, Dieter; Mania, Dieter; and Muschaweck, Roman, 4,393,072, Cl. 424-275.000.

Bortignon, Renzo: *See*—
Belforte, Piero; and Bortignon, Renzo, 4,393,494, Cl. 370-27.000.

Bortolotti, Andrea; and Bettucchi, Mauro, to Automa S.p.A. Apparatus for blow molding and conditioning synthetic resin containers. 4,392,802, Cl. 425-107.000.

Borzym, John J. Tube cutting apparatus. 4,392,644, Cl. 269-157.000.

Bosworth, Jack L. Rimmed cartridge magazine loader. 4,392,321, Cl. 42-87.000.

Botez, Dan, to RCA Corporation. High power semiconductor laser. 4,393,504, Cl. 372-45.000.

Bottcher, Siegfried: *See*—
Gunther, Dieter; Bertsch, Richard; Bottcher, Siegfried; Arnold, Herbert; Schnurle, Hans; and Horbelt, Michael, 4,392,470, Cl. 123-440.000.

Bottenbruch, Ludwig: *See*—
Freitag, Dieter; Bottenbruch, Ludwig; and Wulff, Claus, 4,393,009, Cl. 260-544.00K.

Boudault, Robert, to U.S. Philips Corporation. System for locally testing a modem employing frequency shift keying. 4,393,508, Cl. 375-9.000.

Bourne, W. John. Applicator for granular material. 4,392,587, Cl. 222-63.000.

Boute, Raymond T. G., to International Standard Electric Corporation. Process control apparatus. 4,393,469, Cl. 364-900.000.

Bowden, Charles J., to General Signal Corporation. Gear pump or motor with low pressure bearing lubrication. 4,392,798, Cl. 418-102.000.

Bowler, Eleanor G.: *See*—
Mason, Arthur D., Jr.; Johnson, Avery A., Jr.; Walker, Harrel L.; Bowler, Eleanor G.; and Ritchey, Charles R., 4,393,048, Cl. 424-132.000.

Bowles, David J.; Clancy, Douglas E.; Johnson, Carl F.; and Neal, Danny M., to International Business Machines Corporation. Underscore erase. 4,392,758, Cl. 400-697.100.

Boyd, Mary G.; and Smith, Donald R., to Dennison Manufacturing Company. Method of transferring designs onto articles. 4,392,905, Cl. 156-235.000.

Brachthauser, Kunibert; and Herchenbach, Horst, to Klockner-Humboldt-Deutz AG. System for burning fine-grained material, particularly for the manufacture of cement clinkers. 4,392,822, Cl. 432-106.000.

Bracke, William J. I.; and Lanza, Emmanuel, to Labofina, S.A. Process for preparing rubbery polymer reinforced styrenic resins. 4,393,171, Cl. 525-309.000.

Bradley, John J.: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., 4,392,844, Cl. 493-399.000.

Bredo, Guido. Trouser construction. 4,392,259, Cl. 2-227.000.

Brensing, Karl-Heinz: *See*—
Ramdohr, Detlef; Knauf, Walter; Brensing, Karl-Heinz; and Kummerling, Rolf, 4,392,369, Cl. 72-96.000.

Brent, Albert: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,392,869, Cl. 48-197.00R.

Breuer, Hans: *See*—
McKee, Graham E.; Haaf, Franz; Hambrecht, Juergen; Benker, Klaus; Stephan, Rudolf; and Breuer, Hans, 4,393,164, Cl. 525-83.000.

Breuninger, William F., to National Starch and Chemical Corporation. Method for dewatering starch slurries containing swollen starch granules resulting from treatment with cationic reagents. 4,393,202, Cl. 536-102.000.

Bridgestone Tire Co., Ltd.: *See*—
Kaneda, Hiroshi; Arai, Katsuhiko; Suzuki, Akira; and Ohashi, Takashi, 4,393,015, Cl. 264-51.000.

Bright, David R.: *See*—
Brown, Ross G.; Bright, David R.; and Williams, Robert D., 4,393,041, Cl. 424-19.000.

Briley, Bruce E., to Bell Telephone Laboratories, Incorporated. Optical communication arrangement. 4,393,518, Cl. 455-617.000.

British Petroleum Company Limited, The: *See*—
Moore, Anthony J.; and Silver, Howard B., 4,392,973, Cl. 252-78.100.

Brittain, David R.; and Wood, Robin, to Imperial Chemical Industries PLC. Pharmaceutical compositions and method for the production of an anti-inflammatory effect. 4,393,062, Cl. 424-250.000.

Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Process to produce hexahydronaphthacene derivatives. 4,393,221, Cl. 549-39.000.

Brock, Phillip J.; and Dawson, Daniel J., to Dynapol. Process for the continuous diazotization of water-soluble polymeric amines. 4,393,175, Cl. 525-377.000.

Brock, Phillip J.: *See*—
Dawson, Daniel J.; and Brock, Phillip J., 4,393,174, Cl. 525-369.000.

Brockington, Francis R. Continuous vapor phase chromatography. 4,392,873, Cl. 55-67.000.

Brodsky, Alexander; and Clark, Richard J., to Fisher & Paykel Limited. Method and apparatus for flanging tube ends. 4,392,372, Cl. 72-311.000.

Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, to BASF Aktiengesellschaft. Preparation of propanediols using a copper-and zinc containing hydrogenation catalyst. 4,393,251, Cl. 568-811.000.

Broggi, Renato: *See*—
Falciani, Marco; and Broggi, Renato, 4,393,205, Cl. 544-28.000.

Brokke, Mervin E.: *See*—
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,392,884, Cl. 71-100.000.

Brown, Gerald V., to United States of America, National Aeronautics and Space Administration. Magnetic heat pumping. 4,392,356, Cl. 62-3.000.

Brown, Harold J., to Reliance Electric Co. Transistor drive circuit. 4,393,316, Cl. 307-270.000.

Brown, Leon C.; Campbell, Jesse L.; Fitts, Uscoe J.; and Gudgel, Willard L., to International Business Machines Corporation. Electromechanically operated fuser roll closure. 4,392,739, Cl. 355-3.0FU.

Brown, Marvin R.: *See*—
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,393,050, Cl. 424-177.000.

Brown, Robert J. S.: *See*—
Thompson, Don D.; Brown, Robert J. S.; and Runge, Richard J., 4,393,486, Cl. 367-73.000.

Brown, Ross G.; Bright, David R.; and Williams, Robert D., to International Minerals & Chemical Corp.; and International Minerals & Chemical Corp. Fibrin binder/carrier for active biochemical agents. 4,393,041, Cl. 424-19.000.

Brown, Ross K.; Thompson, Raymond D.; Woods, Terrill W.; Wright, Darrell L.; Conner, James M.; Crookes, William E.; and Purcell, William F., to Deere & Company. Suspended operator station. 4,392,546, Cl. 180-326.000.

Brown, Russell L. Device for use with a toggle bolt. 4,392,763, Cl. 411-342.000.

Brown & Williamson Tobacco Corporation: *See*—
Newton, Richard P.; Harper, Patrick H.; Geiss, Vernon L.; and Jewell, John N., 4,392,501, Cl. 131-300.000.

Bruce Industries, Inc.: *See*—
Petrina, Robert J., 4,393,435, Cl. 361-377.000.

Braderreck, Hartmut: *See*—
Gottlieb, Klaus; Bruderreck, Hartmut; and Wehmeier, Friedel-Heinrich, 4,393,250, Cl. 568-697.000.

Bruggendieck, Siegfried; Nolting, Karl-Heinz; Krahn, Friedrich; and Olejak, Gerhard, to U.S. Philips Corporation. Overhead power cable having light conducting fibers arranged in its interior. 4,392,714, Cl. 350-96.230.

Brunelli, Maurizio: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; and Brunelli, Maurizio, 4,393,218, Cl. 548-530.000.

Brunet, Maurice: *See*—
Habermann, Helmut; and Brunet, Maurice, 4,392,693, Cl. 308-10.000.

Brunswick Corporation: *See*—
Bloemers, James L.; Schiek, James M.; Frazzell, Michael E.; and Karls, Michael A., 4,392,779, Cl. 415-141.000.

Brush Switchgear Limited: *See*—
Stewart, John S.; and Gonek, Stanislaw M., 4,393,291, Cl. 200-148.00R.

Bschorr, Oskar, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Tire with open cell foam insert for reducing noise. 4,392,522, Cl. 152-341.000.

BSL Corporation: *See*—
Gidge, Kenneth N.; and Richard, Henry J., 4,392,360, Cl. 62-249.000.

Buchanan, David J.; Davis, Richard; and Jackson, Peter J., to Coal Industry (Patents) Limited. Method of stacking seismic data. 4,393,484, Cl. 367-23.000.

Buckhouse, Norman O.; Stevens, Aaron A.; and Lawrence, Randall K., to Murray Ohio Manufacturing Co., The. Hydrostatic transmission control. 4,392,543, Cl. 180-272.000.

Budnowski, Manfred: *See*—
Fischer, Herbert; Budnowski, Manfred; and Zeidler, Ulrich, 4,393,060, Cl. 424-248.500.

Bueno, Victor M. Chalkboard eraser cleaner system. 4,392,268, Cl. 15-91.000.

Buhr, Terry J., to Rolscreen Company. Casement window. 4,392,330, Cl. 49-381.000.

Burbank, Max B.; Lomnes, Randy K.; Vrba, Jiri; and Fife, Alistair A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Asymmetrical SQUID. 4,393,349, Cl. 324-248.000.

Burdette, George W.: *See*—
Reed, Russell, Jr.; Burdette, George W.; Meyers, Gary W.; and Vuono, William R., 4,392,895, Cl. 149-19.300.

Burg, Daniel Earl: *See*—
Burg, Donald E., 4,392,445, Cl. 114-67.00A.

Burg, Donald E., to Burg, Paulette Renee; Burg, Sheri Renee; Burg, Daniel Earl; and Burg, Nicole Renee, part interest to each. Flexible bow air ride boat hull. 4,392,445, Cl. 114-67.00A.

Burg, Nicole Renee: *See*—
Burg, Donald E., 4,392,445, Cl. 114-67.00A.

Burg, Paulette Renee: *See*—
Burg, Donald E., 4,392,445, Cl. 114-67.00A.

Burg, Sheri Renee: *See*—
Burg, Donald E., 4,392,445, Cl. 114-67.00A.

Burlington Industries, Inc.: *See*—
Goodnough, Douglas D., 4,392,516, Cl. 139-115.000.

Burrell Construction & Supply Co.: *See*—
Harbaugh, William L.; and Smetana, Raymond S., 4,393,018, Cl. 264-82.000.

Burroughs Corporation: *See*—
Potash, Hanan, 4,393,465, Cl. 364-900.000.

Burroughs Wellcome Co.: *See*—
Moncada, Salvador E., 4,393,063, Cl. 424-251.000.
Peck, Anthony W., 4,393,078, Cl. 424-330.000.

Burton, Donald J.; and Flynn, Richard M., to University of Iowa Research Foundation. Method for the preparation of fluorine-containing phosphonates and phosphonic acids. 4,393,011, Cl. 260-970.000.

Burton, John H.; and Mikulich, Michael A., to American Medical Systems, Inc. Limited bend malleable penile prosthesis. 4,392,562, Cl. 128-79.000.

Burwell, Maurel R. Method of cleaning a well and apparatus thereof. 4,392,529, Cl. 166-255.000.

Buryakov, Viktor P.; Ivanov, Gennady M.; Kislik, Mikhail I.; Kurgansky, Pavel M.; Shmotkin, Mark B.; and Eikhenvald, Eduard V. Dosing device for feeding lubricant to friction couples. 4,392,551, Cl. 184-7.00D.

Buser, Rudolph G.; Osche, Gregory R.; Nomiyama, Neal T.; and Rohde, Robert S., to United States of America, Army. Pulse code modulation of laser pulse tail. 4,393,517, Cl. 455-608.000.

Bush Universal, Inc.: *See*—
LeBaron, Steven M., 4,392,266, Cl. 12-146.00S.

Bushong, Eugene E.: *See*—
Calkins, James D.; Bushong, Eugene E.; and Schuck, Lee R., 4,393,313, Cl. 250-560.000.

Butterfield Group: *See*—
Butterfield, Ida M., 4,392,852, Cl. 604-111.000.

Butterfield, Ida M., to Butterfield Group. Tamper-alerting hypodermic syringe. 4,392,852, Cl. 604-111.000.

Butterfield, John L.: *See*—
Siddiqui, Ehtisham U. A.; Wenzel, James L.; and Butterfield, John L., 4,392,835, Cl. 464-32.000.

Butterworth, George A. M.; and Fillwalk, Frank J., to Johnson & Johnson Baby Products Company. Two-ply fibrous facing material. 4,392,861, Cl. 604-366.000.

Byrne, James C., to Gulf & Western Manufacturing Company. Windshield cleaning system. 4,393,341, Cl. 318-443.000.

C. H. Boehringer Sohn: *See*—
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mierau, Joachim, 4,393,069, Cl. 424-265.000.

Caines, Michael J., to United States of America, Energy. High temperature pressure coupled ultrasonic waveguide. 4,392,380, Cl. 73-644.000.

Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, to International Flavors & Fragrances Inc. Enhancing or augmenting the aroma of detergents using mixtures including 4-methyl-3-cyclohexene-1-carboxylic acid. 4,392,976, Cl. 252-174.110.

Calkins, James D.; Bushong, Eugene E.; and Schuck, Lee R., to Binks Industries, Inc. Width detector system. 4,393,313, Cl. 250-560.000.

Calvert, Harry B., to Calvert Manufacturing, Inc. Knife pitch control for veneer lathe. 4,392,519, Cl. 144-212.000.

Calvert Manufacturing, Inc.: *See*—
Calvert, Harry B., 4,392,519, Cl. 144-212.000.

Cameron, Colin H.: *See*—
Rook, Graham A. W.; and Cameron, Colin H., 4,392,746, Cl. 356-409.000.

Campbell, Henry F.: *See*—
Douglas, George H.; and Campbell, Henry F., 4,393,077, Cl. 424-326.000.

Campbell, Jesse L.: *See*—
Brown, Leon C.; Campbell, Jesse L.; Fitts, Uscoe J.; and Gudgel, Willard L., 4,392,739, Cl. 355-3.0FU.

Campbell, Steve, to Pipe Systems, Incorporated. Method for making polyolefin pipe connector sleeve. 4,392,294, Cl. 29-451.000.

Campeau, Gary P., to Suburban Tool, Inc. Magnetic hold down tool. 4,392,643, Cl. 269-136.000.

Can-Eng Holdings Limited: *See*—
Harding, Brian, 4,392,814, Cl. 431-170.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Burbank, Max B.; Lomnes, Randy K.; Vrba, Jiri; and Fife, Alistair A., 4,393,349, Cl. 324-248.000.
Fenrick, Walter J.; Chesney, Robert H.; and Mast, Paul A., 4,392,432, Cl. 102-334.000.

Canadian Skate Contours, Ltd.: *See*—
Sakcriska, Glenn, 4,392,332, Cl. 51-92.0BS.

Canon Denshi Kabushiki Kaisha: *See*—
Fujimura, Masayuki, 4,393,428, Cl. 360-123.000.

Canon Kabushiki Kaisha: *See*—
Fujimura, Masayuki, 4,393,428, Cl. 360-123.000.
Fujino, Hitoshi; Kanoto, Masanobu; and Ichihashi, Hiroo, 4,392,738, Cl. 355-3.0TR.
Inuzuka, Tsuneki; Murakami, Koichi; Kurita, Kenji; and Sakamaki, Hisashi, 4,392,741, Cl. 355-14.00R.
Iwashita, Tomonori; and Fukahori, Hidehiko, 4,392,730, Cl. 354-173.000.
Kitamura, Takashi, 4,393,387, Cl. 346-108.000.
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,392,907, Cl. 156-252.000.
Yokomizo, Yoshikazu, 4,393,407, Cl. 358-166.000.

Cantwell, Richard F., Jr., to Bell Telephone Laboratories, Incorporated. Loop switching system. 4,393,497, Cl. 370-89.000.

Capezzuto, John P.; and Johnson, Lewis H., to Dennison Manufacturing Company. Retractable ink stamp. 4,392,425, Cl. 101-327.000.

Carella, Richard F. Arrow fletching. 4,392,654, Cl. 273-423.000.

Caridis, Andrew A.; and Benson, Clark K., to Heat & Control, Inc. Recirculating hot oil cooking apparatus. 4,392,420, Cl. 99-406.000.

Carl Freudenberg, Firma: *See*—
Schmidt, Klaus, 4,392,876, Cl. 55-524.000.

Carl Still Gmbh & Co. KG, Firma: *See*—
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,392,823, Cl. 432-114.000.

Carlqvist, Stig G.: *See*—
Tieberg, Lars A.; and Carlqvist, Stig G., 4,392,809, Cl. 431-11.000.

Carrier Corporation: *See*—
Anderson, Gordon K., 4,393,320, Cl. 310-156.000.
O'Mara, Raymond D.; Smorol, Michael E.; and Tobin, Curtis L., 4,392,525, Cl. 165-125.000.

Carron, Henry: *See*—
Tourdot, Jacques; and Carron, Henry, 4,392,975, Cl. 252-99.000.

Casazza, Annamaria: *See*—
Bargiotti, Alberto; Cassinelli, Giuseppe; Penco, Sergio; Arcamone, Federico; and Casazza, Annamaria, 4,393,052, Cl. 424-180.000.

Case, Theodore W. Level rod for grading. 4,392,308, Cl. 33-293.000.

Cassatta, Joseph C.: *See*—
Garrett, David L., Jr.; and Cassatta, Joseph C., 4,393,094, Cl. 427-44.000.

Cassinelli, Giuseppe: *See*—
Bargiotti, Alberto; Cassinelli, Giuseppe; Penco, Sergio; Arcamone, Federico; and Casazza, Annamaria, 4,393,052, Cl. 424-180.000.

Castille, Dale J. Pipe handling apparatus. 4,392,770, Cl. 414-432.000.

Caterpillar Tractor Co.: *See*—
Clarke, John M., 4,392,395, Cl. 74-690.000.
Frantzreb, John G., Sr., 4,393,298, Cl. 219-137.620.
Melocik, Kurt B., 4,392,415, Cl. 91-461.000.
Roley, Robert D., 4,392,657, Cl. 277-95.000.

Cathey, Thaddeus F.: *See*—
Skura, William A.; and Cathey, Thaddeus F., 4,392,842, Cl. 474-205.000.

Cavalli, Alfredo. Self-contained ice cream apparatus. 4,392,361, Cl. 62-343.000.

Celanese Corporation: *See*—
East, Anthony J., 4,393,191, Cl. 528-207.000.
Hanson, Harry T.; and Sapp, John B., Jr., 4,393,241, Cl. 568-49.000.

Celis, Roberto V. Smog eliminator. 4,392,875, Cl. 55-228.000.

Cellulose Attisholz AG.: *See*—
Bertschinger, Hans; and Scherler, Alfred, 4,392,954, Cl. 210-195.300.

Central Safety Equipment Company: *See*—
Gordon, Edmund A., deceased; and Yaecker, John, Administrator, 4,392,344, Cl. 59-78.100.

Chambers, Charles A.: *See*—
Harris, Jeff; Chambers, Charles A.; and Horwitz, Jack M., 4,392,324, Cl. 46-1.00F.

Chang, Long F.: *See*—
Uhlig, Albert R.; and Chang, Long F., 4,392,579, Cl. 215-253.000.

Chang, Moo K. Solar heating panel arrangement. 4,392,482, Cl. 126-440.000.

Chapman, Dan. Hand, wrist and forearm exercising device. 4,392,649, Cl. 272-67.000.

Chareire, Jean-Louis, to Societe Nationale Industrielle Aerospatiale. Four stroke thermal engine capable of temporary boost. 4,392,459, Cl. 123-21.000.

Charles Hoffert of America, Inc.: *See*—
Michaud, Franck, 4,392,289, Cl. 29-160.600.

Charrier, Jean: *See*—
Koulbanis, Constantin; Zabotto, Arlette; Griat, Jacqueline; and Charrier, Jean, 4,393,043, Cl. 424-59.000.

Cheetham, Peter S. J., to Talres Development (N.A.) N.V. Bacterial ethanol production. 4,393,136, Cl. 435-161.000.

Chemische Werke Huls AG: *See*—
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,393,146, Cl. 521-56.000.

Chen, James L.: *See*—
Pawelchak, John M.; Chen, James L.; Cryan, John G.; and LaVia, Anthony L., 4,393,080, Cl. 428-355.000.

Chen, Wen S.: *See*—
Mickelsen, Reid A.; and Chen, Wen S., 4,392,451, Cl. 118-690.000.

Chernoff, Edward A.: *See*—
Schreiner, Gary W.; Kemp, Merle L., Jr.; and Chernoff, Edward A., 4,393,359, Cl. 335-128.000.

Cherry, Norman H.: *See*—
Grosse, Aristid V.; and Cherry, Norman H., 4,392,865, Cl. 44-51.000.

Chesney, Robert H.: *See*—
Fenrick, Walter J.; Chesney, Robert H.; and Mast, Paul A., 4,392,432, Cl. 102-334.000.

Chester, Arthur W.: *See*—
Chu, Yung F.; and Chester, Arthur W., 4,392,989, Cl. 252-455.00Z.

Chevron Research Company: *See*—
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,393,488, Cl. 367-75.000.
Peterson, Terry M., 4,393,267, Cl. 136-260.000.
Thompson, Don D.; Brown, Robert J. S.; and Runge, Richard J., 4,393,486, Cl. 367-73.000.
Wallman, P. Henrik; and Spars, Byron G., 4,392,942, Cl. 208-11.00R.

Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,393,059, Cl. 424-246.000.

Chieffo, Anibole B.; Davis, Howard K.; and Rizzo, Joyce A., to Sun Oil Company of Pennsylvania. Vapor recovery unit performance test analyzer and method. 4,392,870, Cl. 55-20.000.

Child, Edward T.: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,392,869, Cl. 48-197.00R.

Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.

Chitayat, Anwar, to Anorad Corporation. Workpiece positioning table with air bearing pads. 4,392,642, Cl. 269-73.000.

Christmas Club: *See*—
Winiarski, Albert C., 4,392,675, Cl. 282-23.00R.

Chu, Yung F.; and Chester, Arthur W., to Mobil Oil Corporation. Zinc-gallium zeolite. 4,392,989, Cl. 252-455.00Z.

Chubb Fire Security Limited: *See*—
Evans, John L.; and Bains, Kuldip, 4,392,618, Cl. 239-461.000.

Churcher, Dale L.: *See*—
Novoselac, John; and Churcher, Dale L., 4,392,846, Cl. 494-40.000.

Ciaffone, John T., to Warner-Lambert Company. One-piece razor handle. 4,392,303, Cl. 30-85.000.

Ciba-Geigy AG: *See*—
Priester, Martin; and Loew, Peter, 4,393,007, Cl. 260-378.000.

Ciba-Geigy Corporation: *See*—
Andrews, Christopher M., 4,393,180, Cl. 525-504.000.
Berner, Godwin; and Kirchmayr, Rudolf, 4,393,185, Cl. 528-27.000.
Hathaway, Roderick D.; Irving, Edward; and Waterhouse, John S., 4,392,930, Cl. 204-159.140.
Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, 4,392,999, Cl. 260-157.000.
Weiss, Jonas; and Seltzer, Raymond, 4,393,002, Cl. 260-239.30R.

Cinkel Industries, Ltd.: *See*—
Vander Eyken, Gerardus H.; and Thoman, James J., 4,392,446, Cl. 114-144.00R.

Circuit Research Labs: *See*—
Jones, Ronald R., 4,393,346, Cl. 323-280.000.

Claasen, Theodoor A. C. M.; Gielis, Gerardus C. M.; Schmidt, Johan M.; and Schoonheijm, Harry B., to U.S. Philips Corporation. FM-Receiver with transmitter characterization. 4,393,273, Cl. 179-1.0GD.

Clancy, Douglas E.: *See*—
Bowles, David J.; Clancy, Douglas E.; Johnson, Carl F.; and Neal, Danny M., 4,392,758, Cl. 400-697.100.

Clark Equipment Company: *See*—
Dilno, Guy L., 4,392,544, Cl. 180-273.000.
Schultz, Donald L., 4,392,670, Cl. 280-775.000.

Clark, Richard J., to Fisher & Paykel Limited. Forming means. 4,392,373, Cl. 72-321.000.

Clark, Richard J.: *See*—
Brodsky, Alexander; and Clark, Richard J., 4,392,372, Cl. 72-311.000.

Clarke, John M., to Caterpillar Tractor Co. Infinitely variable transmission. 4,392,395, Cl. 74-690.000.

Clemmons, James I., Jr., to United States of America, National Aeronautics and Space Administration. Instrument for determining coincidence and elapse time between independent sources of random sequential events. 4,392,749, Cl. 368-118.000.

Cleveland Clinic Foundation, The: *See*—
Petre, John H.; and Cosgrove, Delos M., 4,392,849, Cl. 604-66.000.

Clough, Douglas O.: *See*—
Parker, Alan; Farnhill, William M.; and Clough, Douglas O., 4,392,343, Cl. 57-401.000.

Clumpner, Joseph A., to Swiss Aluminium Ltd. Apparatus for degassing molten metal. 4,392,636, Cl. 266-218.000.

Coad, Peter, Jr.; and Wilensky, David E., to Way International, The. System for transcribing analog signals, particularly musical notes, having characteristic frequencies and durations into corresponding visible indicia. 4,392,409, Cl. 84-462.000.

Coal Industry (Patents) Limited: *See*—
Buchanan, David J.; Davis, Richard; and Jackson, Peter J., 4,393,484, Cl. 367-23.000.

Cobaugh, Robert F.: *See*—
Andrews, Howard W., Jr.; Billman, Timothy B.; and Cobaugh, Robert F., 4,392,705, Cl. 339-75.0MP.

Coburn Optical Industries, Inc.: *See*—
Tusinski, Joseph; and Hill, Phillip D., 4,392,334, Cl. 51-263.000.

Cochrane, Peter; and Kitchen, James A., to Post Office, The. Digital data transmission system having frequency or phase modulated data carrying signals to provide supervisory channel. 4,393,279, Cl. 179-175.31R.

Coffey, Gerald P.: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,393,192, Cl. 528-292.000.

Coillet, Dudley W. Process for sterilization and removal of inorganic salts from a water stream. 4,392,959, Cl. 210-638.000.

Coin Acceptors, Inc.: *See*—
Maloney, Robert T.; and Vogt, Carl L., 4,392,505, Cl. 133-4.00A.

Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., to Beecham Group Limited. Pharmaceutical compositions. 4,393,079, Cl. 424-331.000.

Coles Cranes Limited: *See*—
Gyomrey, Karl M., 4,392,573, Cl. 212-230.000.

Collier, Robert J.; and Thomson, Michael G. R., to Bell Telephone Laboratories, Incorporated. Variable-spot scanning in an electron beam exposure system. 4,393,312, Cl. 250-492.200.

Colombo, Mario, Jr.: *See*—
Ennis, Gerald E.; and Colombo, Mario, Jr., 4,392,775, Cl. 414-729.000.

Colpo Company Limited: *See*—
Takasugi, Mitsuo; and Okuyama, Ajoshio, 4,392,491, Cl. 604-202.000.

Colt Industries Operating Corp.: *See*—
Douglas, Alec T.; and Havers, James S., 4,393,455, Cl. 364-519.000.

Comact Pump Corporation: *See*—
Kuehn, Andrew, III; and Hoefs, Edwin G., 4,392,782, Cl. 417-36.000.

Combustion Engineering, Inc.: *See*—
Gaines, Albert L., 4,392,918, Cl. 376-133.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See*—
Miard, Pierre V. L., 4,393,470, Cl. 364-200.000.

Concannon, Thomas P., to Du Pont de Nemours, E. I., and Company. Article coated with aqueous dispersion of fluoropolymers in combination with epoxy-type film formers. 4,393,119, Cl. 428-413.000.

Conger, Robert P.: *See*—
Boba, Joseph; and Conger, Robert P., 4,393,187, Cl. 528-60.000.

Congoleum Corporation: *See*—
Boba, Joseph; and Conger, Robert P., 4,393,187, Cl. 528-60.000.

Conner, James M.: *See*—
Brown, Ross K.; Thompson, Raymond D.; Woods, Terrill W.; Wright, Darrell L.; Conner, James M.; Crookes, William E.; and Purcell, William F., 4,392,546, Cl. 180-326.000.

Consortium fur elektrochemische Industrie GmbH: *See*—
Haberle, Norman; Eberle, Otto; and Hafner, Walter, 4,393,220, Cl. 548-545.000.

Conterio, Eugene E. Portable preheating system for internal combustion engines. 4,392,609, Cl. 237-12.30C.

Continental Can Company, Inc.: *See*—
Kubis, Charles S.; and Walter, John, 4,392,764, Cl. 413-69.000.

Continental Group, Inc., The: *See*—
Pushee, Joan C.; Harry, Ieuan L.; Beck, Martin H.; and Krishnakumar, Suppayan M., 4,392,804, Cl. 425-174.80E.

Converse Inc.: *See*—
Crowley, Kevin J.; and Souther, Channing, 4,392,312, Cl. 36-67.00R.

Cook, Paul M., to General Electric Company. Quick disconnect mechanism for shafts. 4,392,759, Cl. 403-11.000.

Cooper, Eugene R.: *See*—
Lucas, Donald S.; Stone, Roger L.; and Cooper, Eugene R., 4,392,848, Cl. 604-53.000.

Cooper Industries, Inc.: *See*—
Jameson, James J.; and Beeson, John M., 4,392,391, Cl. 74-333.000.

Corbeels, Roger J.; and Sengenberger, Charles G., to Texaco Inc. Partial oxidation with recycle of recovered carbon. 4,392,981, Cl. 252-373.000.

Cornelius, Douglas P.; and Erickson, Charles G., to Cornelius Products Inc. Aquarium filtration apparatus. 4,392,953, Cl. 210-169.000.

Cornelius Products Inc.: *See*—
Cornelius, Douglas P.; and Erickson, Charles G., 4,392,953, Cl. 210-169.000.

Corning Glass Works: *See*—
Baret, Jean-Luc A. G., 4,393,138, Cl. 435-176.000.

Coroneos, James H. Beef product for cooking on a vertical rotiserie. 4,393,090, Cl. 426-646.000.

Corrugated Drum Systems, Inc.: *See*—
Perkins, David, Jr., 4,392,607, Cl. 229-39.00R.

Cosden Technology, Inc.: *See*—
Schwarz, Richard A., 4,393,147, Cl. 521-60.000.

Cosgrove, Delos M.: *See*—
Petre, John H.; and Cosgrove, Delos M., 4,392,849, Cl. 604-66.000.

Costanzi, Silvestro; Tessarolo, Francesco; and Brunelli, Maurizio, to Anic, S.p.A. 2,2,4,5,5-Pentamethyl-3-formyl-Δ^3-pyrroline and the preparation thereof. 4,393,218, Cl. 548-530.000.

Costigan, Conrad A., to Spreading Machine Exchange, Inc. Spreading machine cutter box and clamp assembly. 4,392,646, Cl. 270-30.000.

Cottis, Robert A.: *See*—
Knight, Lindsay C.; and Cottis, Robert A., 4,392,652, Cl. 273-358.000.

Couper, Robert A.; Frediani, John K.; and Lillie, Terrance L., to Pitney Bowes Inc. Circuit for controlling information on a display. 4,393,377, Cl. 340-731.000.

Coury, Arthur J.: *See*—
Skarstad, Paul M.; Coury, Arthur J.; and Untereker, Darrel F., 4,393,125, Cl. 429-105.000.

Cox, Charles M.; and Thomas William L., to Zenith Radio Corporation. Special services teletext communications system. 4,393,404, Cl. 358-147.000.

Cox, Roger B.; and Steer, David C., to Lever Brothers Company. Microbial heteropolysaccharide. 4,393,089, Cl. 426-573.000.

Cray, Edgar R.; Davis, Russell R.; Knapp, Maynard K.; Richards, Glenn L.; Root, Bernard H.; and Woodruff, William W., to Stromberg-Carlson Corporation. Message translation arrangement for telephony system with remote port groups. 4,393,495, Cl. 370-56.000.

Crea, Roberto, to Genentech, Inc. Nucleosidic phosphorylating agent and methods. 4,393,010, Cl. 260-940.000.

Crissy, Charles F.; and Holmes, Paul M., to Aeroquip Corporation. Locking web fitting with swivel. 4,392,762, Cl. 410-116.000.

Critikon, Inc.: *See*—
Ho, Nelson; and Kratochvil, Jiri, 4,393,130, Cl. 430-313.000.

Crocker, William A.; and Hug, Duane L., to Teledyne Industries, Inc. Method of preparing ethyl silicate. 4,393,230, Cl. 556-457.000.

Crombeen, Jacobus E.; Crooymans, Petrus W. H. M.; and Visser, Jan, to U.S. Philips Corporation. Magnetron cathode sputtering system. 4,392,939, Cl. 204-298.000.

Crookes, William E.: *See*—
Brown, Ross K.; Thompson, Raymond D.; Woods, Terrill W.; Wright, Darrell L.; Conner, James M.; Crookes, William E.; and Purcell, William F., 4,392,546, Cl. 180-326.000.

Crooymans, Petrus W. H. M.: *See*—
Crombeen, Jacobus E.; Crooymans, Petrus W. H. M.; and Visser, Jan, 4,392,939, Cl. 204-298.000.

Cross, Stephen D.; Frost, Elmer F., Jr.; and Anderson, David N., to FMC Corporation. Stick confection extraction apparatus. 4,392,803, Cl. 425-126.00S.

Crouley, Thomas J., to Wyoming Mineral Corporation. Method of removing uranium from a slurry containing molybdenum. 4,393,028, Cl. 423-15.000.

Crouch, William B.: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,392,869, Cl. 48-197.00R.

Crowley, Kevin J.; and Souther, Channing, to Converse Inc. Outsole for athletic shoe. 4,392,312, Cl. 36-67.00R.
Crum, Glen F.; and Paton, Samuel J., to El Paso Products Company. Tertiary-butylstyrene production. 4,393,263, Cl. 585-443.000.
Cryan, John G.: *See*—
Pawelchak, John M.; Chen, James L.; Cryan, John G.; and LaVia, Anthony L., 4,393,080, Cl. 428-355.000.
Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Belforte, Piero; and Bortignon, Renzo, 4,393,494, Cl. 370-27.000.
Cser, Judit: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.
Culley, Ernest, to Plessey Company plc, The; and Plessey Company plc, The. Digital telecommunications switches network with in-built fault identification. 4,393,490, Cl. 370-13.000.
Curatolo, Benedict S.; and Coffey, Gerald P., to Standard Oil Company, The. Crystalline copolymers prepared from N,N'-terephthaloyldi-beta-alanine and a glycol. 4,393,192, Cl. 528-292.000.
Curry, Roger F. N. Flat bed knitting machine. 4,392,364, Cl. 66-60.00H.
Curtis, Peter J.; and Wunner, William H., to Wistar Institute, The. DNA Which codes for glycoprotein of era-strain rabies virus. 4,393,201, Cl. 536-27.000.
D and D Srl: *See*—
Reiner, Alberto, 4,393,067, Cl. 424-256.000.
Dahms, Francis A., to Emhart Industries, Inc. Glassware forming apparatus with blow mold spray means. 4,392,880, Cl. 65-170.000.
Dai Nippon Printing Co., Ltd.: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.
Daicel Chemical Industries, Ltd.: *See*—
Moriwaki, Takeshi; and Tokuhara, Shinji, 4,393,169, Cl. 525-67.000.
Daihatsu Motor Co., Ltd.: *See*—
Takeda, Koichi; and Sasano, Yoshiro, 4,393,449, Cl. 364-474.000.
Daikin Kogyo Co., Ltd.: *See*—
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,393,231, Cl. 560-73.000.
Nakagawa, Tsuneo; Hiramatsu, Uji; and Honda, Toshihide, 4,393,257, Cl. 570-145.000.
Daimler-Benz Aktiengesellschaft: *See*—
Bauer, Ludwig, 4,392,584, Cl. 220-374.000.
Muller, Manfred, 4,392,277, Cl. 24-196.000.
Wolters, Gerhard; and Wagner, Wilhelm, 4,392,465, Cl. 123-263.000.
Dainichi Kogyo Co., Ltd.: *See*—
Ito, Takao, 4,392,811, Cl. 431-37.000.
Yoshii, Hisao, 4,392,812, Cl. 431-73.000.
Dainippon Mk & Chemicals Inc.: *See*—
Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, 4,393,258, Cl. 585-25.000.
DallaPiazza, Dennis G.: *See*—
Keyes, Gary S.; Georges, Jean-Pierre J.; and DallaPiazza, Dennis G., 4,393,402, Cl. 358-111.000.
Dallman, Brian L. Mounting system. 4,392,629, Cl. 248-205.00R.
Damian, Karl: *See*—
Welschof, Hans-Heinrich; and Damian, Karl, 4,392,838, Cl. 464-175.000.
Damico, Dennis J.; and Pascarella, Vincent J., to Lord Corporation. Thermoplastic polyurethanes prepared by reacting polyisocyanate, polyester polyol, cycloaliphatic diol and a monofunctional chain-terminating compound. 4,393,186, Cl. 528-49.000.
Dana Corporation: *See*—
Reynolds, James T., 4,392,694, Cl. 308-184.00R.
Danchenkov, Jury V.: *See*—
Glebov, Vladimir P.; Krivtsov, Georgy V.; Danchenkov, Jury V.; Khukhry, Sergei A.; and Schepotin, Sergei G., 4,392,567, Cl. 198-544.000.
Dang Vu, Quang: *See*—
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dang Vu, Quang, 4,393,151, Cl. 523-130.000.
Daniels, James A., to Imperial Chemical Industries Plc. Telomerization of butadiene and carbon dioxide. 4,393,224, Cl. 549-273.000.
Daniels, Wiley E.; and Nagy, Dennis J., to Air Products and Chemicals, Inc. Complexes of N-methylolacrylamides with polyalkoxylates and polymerization to ungelled poly(N-methylolacrylamides). 4,393,173, Cl. 525-329.400.
Daniels, William J. Safety strap for handguns. 4,392,318, Cl. 42-1.0LP.
Danielsen, Petter; and Moen, Tor, to Tandberg Data A/S. Generation of a light intensity control signal. 4,393,378, Cl. 340-744.000.
Darby, Vene L., to Rockwell International Corporation. Method of making sandwich structures by superplastic forming and diffusion bonding. 4,392,602, Cl. 228-118.000.
Darrow, Russell E.: *See*—
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Redpath, Diane L., 4,392,617, Cl. 239-290.000.
Dart Industries Inc.: *See*—
Swett, James B.; and Arnold, Ann A., 4,392,594, Cl. 222-530.000.
Dartmouth College, Trustees of: *See*—
Jerard, Robert B., 4,393,450, Cl. 364-474.000.
Davies, Kirk E., to United States of America, Navy. Floating-point A/D and D/A converter. 4,393,369, Cl. 340-347.0AD.
Davis, Howard K.: *See*—
Chieffo, Anibole B.; Davis, Howard K.; and Rizzo, Joyce A., 4,392,870, Cl. 55-20.000.
Davis, Richard: *See*—
Buchanan, David J.; Davis, Richard; and Jackson, Peter J., 4,393,484, Cl. 367-23.000.
Davis, Robert E., to BASF Aktiengesellschaft. Prevention of fouling in internal combustion engines and their exhaust systems and improved gasoline compositions. 4,392,456, Cl. 123-1.00A.
Davis, Russell R.: *See*—
Cray, Edgar R.; Davis, Russell R.; Knapp, Maynard K.; Richards, Glenn L.; Root, Bernard H.; and Woodruff, William W., 4,393,495, Cl. 370-56.000.
Davis, William F.; and Shacter, Stuart B., to Motorola, Inc. Operational amplifier. 4,393,355, Cl. 330-294.000.
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dang Vu, Quang, to Institut Francais du Petrole. Stable suspensions of water-soluble polymers and their manufacture. 4,393,151, Cl. 523-130.000.
Dawson, Daniel J.; and Brock, Phillip J., to Dynapol. Base hydrolysis of pendant amide polymers. 4,393,174, Cl. 525-369.000.
Dawson, Daniel J.: *See*—
Brock, Phillip J.; and Dawson, Daniel J., 4,393,175, Cl. 525-377.000.
Dawsonville Corp., N.V.: *See*—
Niemeijer, Halbe J., 4,392,493, Cl. 128-316.000.
Dearman, Timothy C. Alignment tool. 4,392,641, Cl. 269-49.000.
Debande, Guy F. S., to Labofina, S.A. Process for removing the nitrogen impurities from a hydrocarbon mixture. 4,392,948, Cl. 208-254.00R.
de Block-Martens, Greet: *See*—
Heuvelsland, Albert; Jann, Fritz F. F.; and de Block-Martens, Greet, 4,393,249, Cl. 568-688.000.
DeBona, Bruce T.: *See*—
Reimschuessel, Herbert K.; and DeBona, Bruce T., 4,393,233, Cl. 562-473.000.
Deckard, John I.; and Straub, Robert D., to General Motors Corporation. Electromagnetic unit fuel injector. 4,392,612, Cl. 239-88.000.
Deere & Company: *See*—
Brown, Ross K.; Thompson, Raymond D.; Woods, Terrill W.; Wright, Darrell L.; Conner, James M.; Crookes, William E.; and Purcell, William F., 4,392,546, Cl. 180-326.000.
DeForest, Sherman E.: *See*—
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, 4,393,466, Cl. 364-415.000.
DeGeeter, Melvin J.; McCall, John M.; and Teagarden, Dirk L., to Upjohn Company, The. Animal feed and process. 4,393,065, Cl. 424-251.000.
DeGraw, Joseph I., Jr.; and Sirotnak, Francis M., to SRI International; and Sloan Kettering Institute for Cancer Research. Process and composition for treatment of leukemia and process for preparing the same. 4,393,064, Cl. 424-251.000.
Dehnel, Roger B., to Lever Brothers Company. Process for making absorbent articles. 4,392,908, Cl. 427-194.000.
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, to International Remote Imaging Systems. Method of analyzing particles in a dilute fluid sample. 4,393,466, Cl. 364-415.000.
Delaney, Dennis D.; and Fenton, Donald M., to Union Oil Company of California. Method for reconditioning bacteria-contaminated hydrogen sulfide removing systems. 4,393,037, Cl. 423-573.00R.
De Long, Horace J. Poultry processing apparatus. 4,392,273, Cl. 17-12.000.
De Marco, Michael, to United States of America, Navy. Electro-pneumatic hydraulic control systems. 4,392,443, Cl. 114-20.00R.
de Munck, Hans: *See*—
Van Abeelen, Petrus C. A. M.; and de Munck, Hans, 4,393,161, Cl. 524-506.000.
Demuth, Hans: *See*—
Hage, Manfred; Demuth, Hans; and Junker, Otto, 4,392,526, Cl. 165-154.000.
de Neumann, Frederick B., to Marconi Company Limited, The. Processor arrangement. 4,393,515, Cl. 455-606.000.
Dennison Manufacturing Company: *See*—
Boyd, Mary G.; and Smith, Donald R., 4,392,905, Cl. 156-235.000.
Capezzuto, John P.; and Johnson, Lewis H., 4,392,425, Cl. 101-327.000.
Denny, Clifford M.; and Wampler, Charles W., II, to International Business Machines Corporation. Backlash and runout compensator for lead screw drives. 4,392,757, Cl. 400-328.000.
Dent, Hugh R., to Sterimatic Holdings Limited. Fitments for injection devices. 4,392,859, Cl. 604-198.000.
Deregibus, Alfio, to Goodyear Tire & Rubber Company, The. Method for winding vulcanizable tape. 4,393,099, Cl. 427-177.000.
Deutsch, Edward J., to Arkwin Industries, Inc. Actuator locking device. 4,392,556, Cl. 188-67.000.
De Vries, Adrian J., to Zenith Radio Corporation. Surface wave acoustic device with compensation for diffraction effects. 4,393,358, Cl. 333-194.000.
DeWald, Jack J. Sub-surface safety gate valve. 4,392,631, Cl. 251-58.000.
DeWoskin, Irvin S., to Orthoband Company, Inc. Strapping. 4,392,825, Cl. 433-5.000.
Diamond Shamrock Corporation: *See*—
Lipowski, Stanley A.; and Miskel, John J., Jr., 4,392,917, Cl. 162-168.100.

Dickey-john Corporation: *See*—
Bachman, Wesley J.; and Funk, Robert C., 4,392,611, Cl. 239-74.000.
Didier Engineering GmbH: *See*—
Galow, Manfred; and Joseph, Horst, 4,392,919, Cl. 202-228.000.
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Diesel Kiki Co., Ltd.: *See*—
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Dieulesaint, Eugene: *See*—
Guedj, Richard; Dieulesaint, Eugene; and Royer, Daniel, 4,393,268, Cl. 178-18.000.
Di Giulio, Peter C., to Pitney Bowes Inc. Ink jet printing apparatus. 4,393,386, Cl. 346-75.000.
Dilno, Guy L., to Clark Equipment Company. Controller for electric traction motor. 4,392,544, Cl. 180-273.000.
Dining, Bruce F. Below deck enclosure for pressurized, heavier than air gas. 4,392,449, Cl. 114-343.000.
di Palma, Georgio: *See*—
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Director-General of the Agency of Industrial Science and Technology: *See*—
Nishiyama, Masashi; Kobayashi, Yoshinari; Tokura, Seiichi; and Nishi, Norio, 4,392,916, Cl. 162-157.100.
Disctron, Inc.: *See*—
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Dittmar, Wilfried: *See*—
Franz, Reinhard; and Dittmar, Wilfried, 4,392,405, Cl. 84-1.240.
Dixon, John F. Convertible backpack chair. 4,392,598, Cl. 224-155.000.
Dobfar S.p.A.: *See*—
Falciani, Marco; and Broggi, Renato, 4,393,205, Cl. 544-28.000.
Dobrusskin, Alexander; Klein, Lutz; and Woizan, Gunter, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. High pressure mercury vapor discharge lamp with outer bulb. 4,393,331, Cl. 313-489.000.
Dobson, Jesse C.; and Knight, Richard W., Jr., to GA Technologies Inc. Method of producing stable alumina. 4,392,988, Cl. 252-455.00R.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Struck, Carl-Heinz; and Schumacher, Ralf, 4,392,824, Cl. 432-180.000.
Dr. -Ing. Rudolf Hell GmbH: *See*—
Gast, Uwe; Hennig, Eberhard; Preuss, Dieter; Taudt, Heinz; and Wellendorf, Klaus, 4,393,399, Cl. 358-80.000.
Doi, Toshitada: *See*—
Tanaka, Masato; Furukawa, Shunsuke; Iwamoto, Ikuo; and Doi, Toshitada, 4,393,502, Cl. 371-40.000.
Dolhyj, Serge R.: *See*—
Velenyi, Louis J.; Dolhyj, Serge R.; and Krupa, Andrew S., 4,393,260, Cl. 585-357.000.
Dompas, John M. A., to Metallurgie Hoboken-Overpelt. Apparatus for the continuous manufacture of metallic anodes from molten metal. 4,393,296, Cl. 219-121.0PC.
Donoso, Patricio E., to Extel Corporation. Magnetic dot matrix printing. 4,392,755, Cl. 400-119.000.
Dooley, James L., to R & D Associates. Coal transport system. 4,392,438, Cl. 110-106.00R.
Doring, Gunter: *See*—
Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, 4,393,317, Cl. 307-309.000.
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Teckmeyer, Fred W.; and Dorn, George K., 4,392,868, Cl. 44-56.000.
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Dotson, Billy J.: *See*—
Odeh, Aziz S.; and Dotson, Billy J., 4,392,530, Cl. 166-269.000.
Douglas, Alec T.; and Havers, James S., to Colt Industries Operating Corp. Modular electronic measuring and printing unit. 4,393,455, Cl. 364-519.000.
Douglas, George H.; and Campbell, Henry F., to William H. Rorer, Inc. 1-Methylene-1-phenylguanidine compounds. 4,393,077, Cl. 424-326.000.
Douke, Harumi: *See*—
Iwata, Masayosi; and Douke, Harumi, 4,393,280, Cl. 200-4.000.
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Dow Chemical Company, The: *See*—
Heuvelsland, Albert; Jann, Fritz F. F.; and de Block-Martens, Greet, 4,393,249, Cl. 568-688.000.
Lee, John M.; and Bauman, William C., 4,392,961, Cl. 210-679.000.
Lee, John M.; and Bauman, William C., 4,392,979, Cl. 252-184.000.
Lee, John M.; and Bauman, William C., 4,392,980, Cl. 252-184.000.
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Dragerwerk Aktiengesellschaft: *See*—
Eckstein, Wolfgang; Rabenecker, Horst; and Behnke, Jurgen, 4,392,389, Cl. 73-864.910.
Drechsel, Erhart K.; Holcomb, Dysart E.; and Sardisco, John B., to Pennzoil Company. Production of phosphoric acid and additional products from phosphate ore. 4,393,032, Cl. 423-320.000.
Dresner, Joseph: *See*—
Goldstein, Bernard; Dresner, Joseph; and Szostak, Daniel J., 4,393,348, Cl. 324-158.00R.
Du, Nguyen T.; and Asao, Akihide, to Texas Instruments Incorporated. Method for controlling characteristics of a semiconductor integrated by X-ray bombardment. 4,392,893, Cl. 148-1.500.
Du, Nguyen T.; and Asao, Akihide, to Texas Instruments Incorporated. Method for erasing data of a non-volatile semiconductor memory integrated circuit. 4,393,479, Cl. 365-218.000.
Duff-Norton Company: *See*—
Johnson, James C., 4,392,390, Cl. 74-89.150.
Dugan, Charles; and Dugan, Timothy, to Farm Fresh Shrimp Corporation. Apparatus and method for rearing shrimp. 4,392,454, Cl. 119-2.000.
Dugan, Timothy: *See*—
Dugan, Charles; and Dugan, Timothy, 4,392,454, Cl. 119-2.000.
Dungs, Horst: *See*—
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Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., to Epsco Incorporated. Navigational plotting system. 4,393,448, Cl. 364-449.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bonifaz, Cristobal, 4,393,265, Cl. 585-639.000.
Concannon, Thomas P., 4,393,119, Cl. 428-413.000.
Middleton, William J., 4,393,074, Cl. 424-285.000.
Squire, Edward N., 4,393,227, Cl. 549-455.000.
Durable Packaging Corporation: *See*—
Ulrich, Lawrence W.; and Walker, Connie W., 4,392,911, Cl. 156-468.000.
Durrell, Robert R., to United States of America, Navy. Ultrasonic loading of extrudable plastic bonded explosives. 4,392,410, Cl. 86-1.00R.
Durwald, Dierk; and Kaufmann, Karl-Ernst, to Mannesmann Demag AG. Turbulent waterway. 4,392,434, Cl. 104-70.000.
Duskin Franchise Kabushiki Kaisha: *See*—
Nishiyama, Masanobu; Kanazawa, Fusao; Tanaka, Hisaji; and Nishimura, Tatsuo, 4,392,269, Cl. 15-145.000.
Dusza, John P.; and Albright, Jay D., to American Cyanamid Company. Substituted phenyl-5-aminopyrazoles. 4,393,217, Cl. 548-362.000.
Dworsky, Lawrence N.: *See*—
Whalin, Jeffery A.; Shanley, Charles W.; Scamaroli, Michael N.; and Dworsky, Lawrence N., 4,393,131, Cl. 430-320.000.
Dynabrade, Inc.: *See*—
Welsch, Walter N., 4,392,333, Cl. 51-170.0EB.
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Brock, Phillip J.; and Dawson, Daniel J., 4,393,175, Cl. 525-377.000.
Dawson, Daniel J.; and Brock, Phillip J., 4,393,174, Cl. 525-369.000.
Dyneer Corporation: *See*—
Radocaj, Mijo, 4,392,840, Cl. 474-117.000.
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Rann, Harald, 4,392,402, Cl. 83-345.000.
E. R. Squibb & Sons, Inc.: *See*—
Pawelchak, John M.; Chen, James L.; Cryan, John G.; and LaVia, Anthony L., 4,393,080, Cl. 428-355.000.
East, Anthony J., to Celanese Corporation. Preparation of aromatic polyesters by direct self-condensation of aromatic hydroxy acids. 4,393,191, Cl. 528-207.000.
Eastman Kodak Company: *See*—
Allen, Robert P., 4,393,261, Cl. 585-422.000.
Barker, Leland W., 4,393,451, Cl. 364-510.000.
Phillips, Bobby M., 4,392,808, Cl. 425-464.000.
Van Heyningen, Roger S., 4,392,731, Cl. 354-180.000.
Eaton Corporation: *See*—
Merritt, Robert C.; and Terwilliger, Gerald L., 4,392,472, Cl. 123-564.000.
Zajac, John, 4,392,915, Cl. 156-643.000.
Ebara Corporation: *See*—
Shibata, Tomoyuki; Nakayama, Mituhito; and Ouchi, Kiyoshi, 4,392,790, Cl. 417-360.000.
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Eberle, Otto: *See*—
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Eckert, Charles E.; and Miller, Ronald E., to Aluminum Company of America. Metal treatment system. 4,392,888, Cl. 75-68.00R.
Eckholt, Heinz: *See*—
Horstmann, Aloys; Eckholt, Heinz; and Veltel, Reinhard, 4,392,340, Cl. 57-83.000.
Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Rotary machining tools with side coolant delivery. 4,392,761, Cl. 408-59.000.
Eckler, Paul E., to Angus Chemical Company. Method of preparing polyurethane foams using imidazolines as catalysts. 4,393,149, Cl. 521-129.000.
Eckstein, Wolfgang; Rabenecker, Horst; and Behnke, Jurgen, to Dragerwerk Aktiengesellschaft. Sampling tube having closing caps. 4,392,389, Cl. 73-864.910.
Ecodyne Corporation: *See*—
Soriente, Alfonse J., 4,392,955, Cl. 210-195.400.
Edmonds, James T., Jr., to Phillips Petroleum Company. Arylene sulfide polymer preparation. 4,393,197, Cl. 528-388.000.

Edwards, Allan K., to International Telephone and Telegraph Corporation. Automatic protection apparatus for span lines employed in high speed digital systems. 4,393,493, Cl. 370-16.000.

Efamol Limited: *See*—
Horrobin, David F., 4,393,049, Cl. 424-145.000.

Egorov, Vladimir D.: *See*—
Merenkov, Jury F.; Egorov, Vladimir D.; Stepanov, Valentin G.; and Popkov, Igor V., 4,392,786, Cl. 417-50.000.

Eguchi, Osamu; Hattori, Mitsutoshi; and Hanaoka, Takatsugu, to Nippondenso Co., Ltd. Rotational angle detecting apparatus. 4,392,375, Cl. 73-118.000.

Eguchi, Yasukata, to Janome Sewing Machine Co. Ltd. Sewing machine with buttonhole stitching mechanism. 4,392,441, Cl. 112-158.00B.

Ehrnford, Lars E. M. Method for restoring a tooth. 4,392,828, Cl. 433-217.000.

Eikhenvald, Eduard V.: *See*—
Buryakov, Viktor P.; Ivanov, Gennady M.; Kislik, Mikhail I.; Kurgansky, Pavel M.; Shmotkin, Mark B.; and Eikhenvald, Eduard V., 4,392,551, Cl. 184-7.00D.

Eisenberg, Gustav; and Bigorajski, Gunter, to Vereinigte Schmirgel und Maschinen-Fabriken AG. Method for the manufacture of granular grit for use as abrasives. 4,393,021, Cl. 264-143.000.

El Paso Products Company: *See*—
Crum, Glen F.; and Paton, Samuel J., 4,393,263, Cl. 585-443.000.

Elchenko, Stephen M.: *See*—
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Electra Food Machinery, Inc.: *See*—
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Electric Power Research Institute, Inc.: *See*—
Itani, Abdallah M., 4,393,516, Cl. 455-608.000.

Electrohome Limited: *See*—
Schmidt, Terrance C., 4,393,336, Cl. 315-387.000.

Elektro-Physik Hans Nix & Dr. Ing. E. Steingroever, K.G.: *See*—
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Elevator GmbH: *See*—
Kahkipuro, Matti, 4,393,442, Cl. 363-70.000.

Elias, Allen M.; and Genese, Joseph N., to Abbott Laboratories. In-line transfer unit. 4,392,850, Cl. 604-82.000.

Elias, Allen M., to Abbott Laboratories. In-line transfer unit. 4,392,851, Cl. 604-82.000.

Elliott Turbomachinery Co., Inc.: *See*—
Geary, Carl H., Jr., 4,392,345, Cl. 60-39.020.

Ellis, J. Nigel. Fall protection device. 4,392,555, Cl. 188-65.100.

Elprochine AG: *See*—
Biller, Efim, 4,393,239, Cl. 564-331.000.

Elsenbaumer, Ronald L.; and Wasserman, Edel, to Allied Corporation. Selective aromatic nitration. 4,392,978, Cl. 252-182.000.

Emery Industries, Inc.: *See*—
Harris, Eugene G., 4,393,223, Cl. 549-266.000.

Emery, Kenneth R. D.: *See*—
Bears, John D.; and Emery, Kenneth R. D., 4,392,810, Cl. 431-37.000.

Emhart Industries, Inc.: *See*—
Dahms, Francis A., 4,392,880, Cl. 65-170.000.
Kinsey, Brian D.; and Smock, Steven W., 4,392,357, Cl. 62-153.000.
Proctor, Gary R., 4,393,300, Cl. 219-497.000.

Emilio, Carlo, Jr.: *See*—
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Emmanuelli, Yves A.: *See*—
Beck, Jean L.; le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, 4,393,408, Cl. 358-205.000.

Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, to Toray Industries, Inc. Process for making a thermal-insulating nonwoven bulky product. 4,392,903, Cl. 156-167.000.

Ener-Tech Heating Systems Inc.: *See*—
Bears, John D.; and Emery, Kenneth R. D., 4,392,810, Cl. 431-37.000.

Energy Research Corporation: *See*—
Lambrech, Matthew A., 4,393,123, Cl. 429-24.000.

Enge, Harald A. High voltage power supply. 4,393,441, Cl. 363-61.000.

Engelbach, Heinz; Steigleiter, Werner; and Glietenberg, Helmut, to BASF Aktiengesellschaft. Olefin oligomerization catalysts and a process for their preparation. 4,392,984, Cl. 252-432.000.

Engelfriet, Adrianus R. C.; Op Het Veld, Adriaan J. G.; and Van Vucht, Theodorus J. P., to U.S. Philips Corporation. Method of producing a drawing die. 4,392,397, Cl. 76-107.00A.

Engels, Larry O.: *See*—
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Engineering Development Company: *See*—
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Ennis, Gerald E.; and Colombo, Mario, Jr., to United States of America, Air Force. Flat workpiece pickup. 4,392,775, Cl. 414-729.000.

Enokimoto, Akito: *See*—
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Enomoto, Hiroshi: *See*—
Iwai, Kazuhiro; Enomoto, Hiroshi; Enokimoto, Akito; and Kato, Yoshitaka, 4,392,536, Cl. 180-217.000.

Epsco Incorporated: *See*—
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ERCO Industries Limited: *See*—
Fredette, Maurice C. J., 4,393,035, Cl. 423-478.000.
Fredette, Maurice C. J., 4,393,036, Cl. 423-478.000.

Erickson, Charles G.: *See*—
Cornelius, Douglas P.; and Erickson, Charles G., 4,392,953, Cl. 210-169.000.

ESPE Fabrik Pharmazeutischer Preparate GmbH: *See*—
Herold, Wolf-Dietrich, 4,392,589, Cl. 222-137.000.

Ess, Wilfried, to Schelling & Co. Apparatus for staggered cutting of planar workpieces. 4,392,401, Cl. 83-219.000.

Esselte Pendaflex Corporation: *See*—
Schrotz, Kurt; and Schwobel, Richard, 4,392,424, Cl. 101-111.000.

Estes, John H.; and Herbstman, Sheldon, to Texaco Inc. Hydrodesulfurization of hydrocarbons with fluorided platinum. 4,392,946, Cl. 208-217.000.

Etablissement Texcontor: *See*—
Zemp, Hans N., 4,393,145, Cl. 521-38.000.

Etablissements Fernand Berchet: *See*—
Rivollet, Marc; and Monzer, Pierre, 4,393,284, Cl. 200-60.000.

Eue, Ludwig: *See*—
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Euzen, Jean-Paul; Jacquin, Yves; and Van Landeghem, Hugo, deceased (by Van Landeghem-Heynderickx, Renate, executor), to Institut Francais du Petrole. Process and device for withdrawing solid particles and introducing a liquid charge at the lower portion of a contact zone. 4,392,943, Cl. 208-152.000.

Evans, John L.; and Bains, Kuldip, to Chubb Fire Security Limited. Liquid-projecting monitor. 4,392,618, Cl. 239-461.000.

Evans, Randall G., to Ford Aerospace & Communications Corporation. Adaptive signal quality measurement circuit for PSK and FSK demodulators. 4,393,499, Cl. 371-5.000.

Evon, Marc A. Ice skate scabbard. 4,392,674, Cl. 280-825.000.

Extel Corporation: *See*—
Adler, Robert, 4,392,754, Cl. 400-119.000.
Donoso, Patricio E., 4,392,755, Cl. 400-119.000.

Exxon Research and Engineering Co.: *See*—
Alexander, A. Gordon, 4,392,967, Cl. 252-41.000.
Howard, Kent A.; and Goetsch, Duane A., 4,392,945, Cl. 208-210.000.
Michaelson, Robert C.; and Austin, Richard G., 4,393,253, Cl. 568-860.000.
Yang, Tai-Cheng; Rao, Krishna K.; and Huang, I-Der, 4,392,986, Cl. 252-435.000.

Eye-D Development II Ltd.: *See*—
Hill, Robert B., 4,393,366, Cl. 382-2.000.

Fabian, Peter; and Muller, Theo, to Heraeus Elektroden GmbH. Novel electrode. 4,392,927, Cl. 204-98.000.

Fahlen, Theodore S., to GTE Sylvania Incorporated. Gas discharge laser having a buffer gas of neon. 4,393,505, Cl. 372-57.000.

Fairchild Camera & Instrument Corp.: *See*—
Ong, Warren R., 4,393,476, Cl. 365-203.000.
Rufford, Roger V., 4,393,473, Cl. 365-190.000.

Fairchild Engineering Company, The: *See*—
Gorenflo, Donald L.; and Noblit, William D., III, 4,393,401, Cl. 358-107.000.

Falciani, Marco; and Broggi, Renato, to Dobfar S.p.A. Cephapirine esters and salts thereof. 4,393,205, Cl. 544-28.000.

Farley, Max F.; and Fine, Laughton T., to Queue Systems, Inc. Apparatus and method for precision gas mixing. 4,392,514, Cl. 137-624.200.

Farm Fresh Shrimp Corporation: *See*—
Dugan, Charles; and Dugan, Timothy, 4,392,454, Cl. 119-2.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Bargiotti, Alberto; Cassinelli, Giuseppe; Penco, Sergio; Arcamone, Federico; and Casazza, Annamaria, 4,393,052, Cl. 424-180.000.

Farnhill, William M.: *See*—
Parker, Alan; Farnhill, William M.; and Clough, Douglas O., 4,392,343, Cl. 57-401.000.

Fassauer, Arthur L., to Geosource Inc. Apparatus for metering semiflowable material. 4,392,591, Cl. 222-227.000.

Fastbac Research Limited: *See*—
Taylor, Derek P., 4,393,116, Cl. 428-343.000.

Faust, Wilfried: *See*—
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,392,882, Cl. 71-92.000.

Fechter, Leonhard; and Jung, Hubert, to Passavant-Werke Michelbacher Huette. Bar screen with screen cleaner for waste water treatment installations. 4,392,952, Cl. 210-159.000.

Fedorets, Vladimir N.: *See*—
Bagdasarian, Alexandr S.; Gulyaev, Jury V.; Fedorets, Vladimir N.; and Kmita, Anatoly M., 4,393,321, Cl. 310-313.00B.

Feldman, Leonard C.; Kraus, Joseph S.; Tolk, Norman H.; Traum, Morton M.; and Tully, John C., to Bell Telephone Laboratories, Incorporated. Method and apparatus for surface characterization and process control utilizing radiation from desorbed particles. 4,393,311, Cl. 250-459.100.

Feldman, Stanley; and Koch, Gary, to Beltone Electronics Corporation. Hearing aid with controllable wide range of frequency response. 4,393,275, Cl. 179-1.0VL.

Felten & Guilleaume Carlswerk AG: *See*—
Piter, Hans; and Serapins, Klaus, 4,392,713, Cl. 350-96.210.

Fenrick, Walter J.; Chesney, Robert H.; and Mast, Paul A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Air burst munitions simulator. 4,392,432, Cl. 102-334.000.

Fenton, Donald M.: *See*—
Delaney, Dennis D.; and Fenton, Donald M., 4,393,037, Cl. 423-573.00R.

Ferranti Limited: *See*—
Bell, Melvyn R.; and Thomson, Charles D., 4,393,437, Cl. 361-383.000.
Ferranti Limited (now Ferranti plc): *See*—
Morrison, John M., 4,392,718, Cl. 350-336.000.
Fields, Ellis K.: *See*—
Nimry, Tayseer S.; and Fields, Ellis K., 4,393,222, Cl. 549-234.000.
Fife, Alistair A.: *See*—
Burbank, Max B.; Lomnes, Randy K.; Vrba, Jiri; and Fife, Alistair A., 4,393,349, Cl. 324-248.000.
Fillwalk, Frank J.: *See*—
Butterworth, George A. M.; and Fillwalk, Frank J., 4,392,861, Cl. 604-366.000.
Fine, Laughton T.: *See*—
Farley, Max F.; and Fine, Laughton T., 4,392,514, Cl. 137-624.200.
Fink, Allen H., to UOP Inc. Cogeneration process using augmented Brayton cycle. 4,392,346, Cl. 60-39.040.
Fink, Helen M., to Fink, Helen M. Table placemat. 4,393,104, Cl. 428-7.000.
Finkel, Abram R., to KSD Industries, Inc. Track and panel guide for sliding shower doors or the like. 4,392,272, Cl. 16-95.00R.
Fipp, Bernard E.: *See*—
Fipp, Beverly A.; Fipp, Bernard E.; and Haller, John L., 4,392,578, Cl. 215-231.000.
Fipp, Beverly A.; Fipp, Bernard E.; and Haller, John L. Stopper apparatus for content contamination prevention. 4,392,578, Cl. 215-231.000.
Firepower, Inc.: *See*—
Gwinn, Mack W., Jr., 4,392,413, Cl. 89-14.00C.
Firmenich, SA: *See*—
Thomas, Alan F.; and Naf, Ferdinand, 4,392,993, Cl. 252-522.00R.
Firth, Bruce E., to UOP Inc. Alkylated 5,6,7,8-tetrahydronaphthalenols as antioxidants in lubricating oils and greases. 4,392,969, Cl. 252-52.00R.
Fischer, Herbert; Budnowski, Manfred; and Zeidler, Ulrich, to Henkel Kommanditgesellschaft auf Aktien. Isocyanuric acid derivatives, method of preparation, therapeutic compositions with a cytostatic action and therapeutic method. 4,393,060, Cl. 424-248.500.
Fisher, Mancil C.: *See*—
Mason, James V.; and Fisher, Mancil C., 4,392,660, Cl. 280-751.000.
Fisher & Paykel Limited: *See*—
Brodsky, Alexander; and Clark, Richard J., 4,392,372, Cl. 72-311.000.
Clark, Richard J., 4,392,373, Cl. 72-321.000.
Fitts, Uscoe J.: *See*—
Brown, Leon C.; Campbell, Jesse L.; Fitts, Uscoe J.; and Gudgel, Willard L., 4,392,739, Cl. 355-3.0FU.
Fives-Cail Babcock: *See*—
Henin, Jean-Pierre; and Ghestem, Gerard, 4,392,890, Cl. 106-100.000.
Fix, Sidney R.: *See*—
Tyler, Keith A.; and Fix, Sidney R., 4,393,154, Cl. 524-12.000.
Fletcher, James D. Bowstring release device. 4,392,475, Cl. 124-35.00A.
Flow Industries, Inc.: *See*—
Olsen, John H.; and Pritchard, Robert S., 4,392,655, Cl. 277-1.000.
Flynn, Richard M.: *See*—
Burton, Donald J.; and Flynn, Richard M., 4,393,011, Cl. 260-970.000.
FMC Corporation: *See*—
Billett, Ronald J.; and Viitanen, Veikko K., 4,392,600, Cl. 227-50.000.
Cross, Stephen D.; Frost, Elmer F., Jr.; and Anderson, David N., 4,392,803, Cl. 425-126.00S.
Fohl, Artur, to REPA Feinstanzwerk GmbH. Automatic roll-up device for a safety belt. 4,392,619, Cl. 242-107.200.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Securing device for the safety belt of a restraining system. 4,392,671, Cl. 280-802.000.
Folkesson, Hans; and Uberg, Ulf, to Saab-Scania Aktiebolag. Arrangement for presses. 4,392,368, Cl. 72-63.000.
Ford Aerospace & Communications Corporation: *See*—
Evans, Randall G., 4,393,499, Cl. 371-5.000.
Ford Motor Company: *See*—
Garrett, David L., Jr.; and Cassatta, Joseph C., 4,393,094, Cl. 427-44.000.
Stinson, Wilbur G.; Schwei, Lawrence J.; and Vong, Sandy T. S., 4,393,098, Cl. 427-168.000.
Fork, Kurt; Kaufhold, Wolfgang; Meusel, Wolfgang; and Waldmann, Hermann, to Siemens Aktiengesellschaft. Circuit for damping hunting by electric machines. 4,393,345, Cl. 322-19.000.
Forslund, Gosta. Training cart. 4,392,663, Cl. 280-68.000.
Forster, Karl-Heinz; and Johne, Hans, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Multiplicative adjustment provision at an ink feed remote control device. 4,392,429, Cl. 101-365.000.
Foster, James I.: *See*—
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,393,488, Cl. 367-75.000.
Foster, Stephen W., to Almor Corporation. Two hand scanning check-out counter. 4,392,553, Cl. 186-61.000.
Fox, Austin L., to Molins Limited. Packets and the manufacture thereof. 4,392,338, Cl. 53-462.000.
Foxcroft, Arthur. Peristaltic pump. 4,392,794, Cl. 417-475.000.
Foy, Peter S. Theatrical transportation apparatus. 4,392,648, Cl. 272-24.000.
Franke, Helmut, to ITT Industries, Inc. Mechanical actuating device for a spot-type disc brake. 4,392,557, Cl. 188-71.900.
Franklin, James L., to Sigma Research, Inc. Direct expansion solar collector-heat pump system. 4,392,359, Cl. 62-235.100.
Frantzreb, John G., Sr., to Caterpillar Tractor Co. Liquid cooling for a welding torch. 4,393,298, Cl. 219-137.620.
Franz, James H., Jr.: *See*—
Jones, Stanley W.; and Franz, James H., Jr., 4,393,338, Cl. 318-66.000.
Franz, Reinhard; and Dittmar, Wilfried, to Franz, Reinhard. Method and apparatus for processing tone signals in electronic musical instruments. 4,392,405, Cl. 84-1.240.
Frazzell, Michael E.: *See*—
Bloemers, James L.; Schiek, James M.; Frazzell, Michael E.; and Karis, Michael A., 4,392,779, Cl. 415-141.000.
Fredette, Maurice C. J., to ERCO Industries Limited. Chlorine dioxide production using mixed hydrochloric and sulfuric acid feed. 4,393,035, Cl. 423-478.000.
Fredette, Maurice C. J., to ERCO Industries Limited. Production of mixed sulfuric and hydrochloric acid feed and chlorine dioxide generation therewith. 4,393,036, Cl. 423-478.000.
Frediani, John K.: *See*—
Couper, Robert A.; Frediani, John K.; and Lillie, Terrance L., 4,393,377, Cl. 340-731.000.
Freimiller, Gary L.: *See*—
Tyrell, John A.; and Freimiller, Gary L., 4,393,190, Cl. 528-170.000.
Freitag, Dieter; Bottenbruch, Ludwig; and Wulff, Claus, to Bayer Aktiengesellschaft. Process for the preparation of aromatic dicarboxylic acid dichlorides. 4,393,009, Cl. 260-544.00K.
Fremion, Edwin A., to Westvaco Corporation. Pre-banded bulk pack container. 4,392,606, Cl. 229-23.00R.
Fried, Krupp Huttenwerke AG: *See*—
Raquet, Erwin, 4,392,681, Cl. 295-7.000.
Friedrich W. Schwing, GmbH: *See*—
Heckmann, Horst; and Nawroth, Werner, 4,392,510, Cl. 137-454.200.
Friese, Karl-Hermann: *See*—
Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, 4,393,282, Cl. 200-19.00R.
Fritz, Gary R., to Kimball International, Inc. Switched capacitor sine wave generator and keyer. 4,392,406, Cl. 84-1.260.
Frommer, Moshe A.: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,392,960, Cl. 210-651.000.
Frosien, Juergen: *See*—
Anger, Klaus; Frosien, Juergen; Lischke, Burkhard; Plies, Erich; and Tonar, Klaus, 4,393,308, Cl. 250-396.00R.
Frost, Elmer F., Jr.: *See*—
Cross, Stephen D.; Frost, Elmer F., Jr.; and Anderson, David N., 4,392,803, Cl. 425-126.00S.
Fuji Electric Company, Ltd.: *See*—
Saito, Shigemasa, 4,392,302, Cl. 29-879.000.
Shimizu, Masami; and Momo, Asao, 4,393,305, Cl. 250-358.100.
Fuji Electrochemical Co., Ltd.: *See*—
Torii, Michihiro; Hirukawa, Kohei; Urata, Hiroshi; and Suzuki, Shinichi, 4,393,373, Cl. 340-384.00E.
Fuji Photo Film Co., Ltd.: *See*—
Honjo, Satoru; Yuyama, Yasuaki; Iwasa, Masakazu; and Imanishi, Kazuo, 4,393,112, Cl. 428-207.000.
Shiba, Keisuke; Nakao, Sho; and Toyama, Tadao, 4,393,128, Cl. 430-273.000.
Fuji Xerox Co., Ltd.: *See*—
Sekimoto, Sohichi, 4,392,719, Cl. 350-342.000.
Fujii, Akira: *See*—
Beppu, Norio; and Fujii, Akira, 4,392,733, Cl. 354-266.000.
Fujii, Kunihiko; Hirosaki, Yukihiro; Nishiyama, Yoshihisa; and Sato, Koichiro, to Tokyo Electric Co., Ltd. Zero-point adjusting method for automatic weighing apparatus. 4,392,535, Cl. 177-1.000.
Fujii, Naoharu; and Iijima, Noboru. Method of treating gastric, mammary, lung and uterus tumors. 4,393,071, Cl. 424-274.000.
Fujii, Takayuki; and Suda, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Instrument panel with a yieldable meter casing. 4,392,539, Cl. 180-90.000.
Fujii, Tetsuo: *See*—
Kondo, Nobuo; Naganoma, Masanori; Hibi, Hitoshi; Fujii, Tetsuo; and Suzuki, Kunihiko, 4,393,365, Cl. 340-57.000.
Fujikawa, Tsuneo; and Takagishi, Haruyoshi, to Nissan Motor Company, Limited. Two-shift automatic assembling apparatus. 4,392,601, Cl. 228-4.100.
Fujikin International, Inc.: *See*—
Kita, Toshio, 4,392,634, Cl. 251-129.000.
Fujimura, Masayuki, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic head. 4,393,428, Cl. 360-123.000.
Fujinami, Hiroshi; and Yamada, Takashi, to Nippondenso Co., Ltd. Method for selectively displaying a plurality of information. 4,393,271, Cl. 179-1.0SM.
Fujino, Hitoshi; Kanoto, Masanobu; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Image transfer device. 4,392,738, Cl. 355-3.0TR.
Fujisawa, Kiyoji: *See*—
Kobayashi, Masaaki; Takeuchi, Akihiro; and Fujisawa, Kiyoji, 4,393,417, Cl. 360-10.300.
Takeuchi, Akihiro; Kobayashi, Masaaki; and Fujisawa, Kiyoji, 4,393,416, Cl. 360-10.200.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Sato, Yoshinari; and Teraji, Tsutomu, 4,393,070, Cl. 424-266.000.

Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,393,059, Cl. 424-246.000.

Fujita, Takashi: *See*—
Shinohara, Koichi; and Fujita, Takashi, 4,393,091, Cl. 427-13.000.

Fujita, Yutaka: *See*—
Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, 4,393,258, Cl. 585-25.000.

Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; and Inoue, Michiya, 4,393,500, Cl. 371-13.000.

Fujitsu Limited: *See*—
Shimada, Hiroshi; and Aoyama, Keizo, 4,393,472, Cl. 365-190.000.
Shimada, Hiroshi, 4,393,480, Cl. 365-227.000.
Shirasaki, Masataka, 4,392,722, Cl. 350-375.000.
Takahashi, Masayuki; Goto, Kunihiko; Tanaka, Hisami; and Ohhata, Michinobu, 4,393,318, Cl. 307-353.000.

Fujiu, Takahiro; Nakajima, Masao; and Okano, Shigeru, to Toppan Printing Co., Ltd. Method of modifying the dye affinity of cellulose fiber-containing structure with benzene sulfonyl chloride. 4,392,265, Cl. 8-120.000.

Fujiwara, Khosuke: *See*—
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, 4,393,210, Cl. 546-141.000.

Fujizoki Pharmaceutical Co., Ltd.: *See*—
Yano, Akira; Saito, Yoshitada; and Kasahara, Yasushi, 4,393,134, Cl. 435-29.000.

Fuju Jiko Kabushiki Kaisha: *See*—
Iwasaki, Hiroshi, 4,393,363, Cl. 335-288.000.

Fukahori, Hidehiko: *See*—
Iwashita, Tomonori; and Fukahori, Hidehiko, 4,392,730, Cl. 354-173.000.

Fukami, Teruki: *See*—
Okuda, Kuniteru; Fukami, Teruki; Asayama, Yoshiaki; Wada, Shunichi; and Kabuto, Masami, 4,392,385, Cl. 73-861.230.

Fukube, Nobuyoshi: *See*—
Miyamoto, Mitsuyasu; Ishimaru, Osamu; and Fukube, Nobuyoshi, 4,392,365, Cl. 68-19.000.

Fukuda, Kazumasa, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,393,110, Cl. 428-173.000.

Fukui, Masanori: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Kasai, Masaji; Hirayama, Noriaki; Morimoto, Makoto; and Fukui, Masanori, 4,393,056, Cl. 424-181.000.

Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., to Paper Converting Machine Company. Method and apparatus for correcting stack lean in a zig-zag folded web. 4,392,844, Cl. 493-399.000.

Fultz, Brent T., to United States of America, Energy. Radiation detector. 4,393,306, Cl. 250-374.000.

Funari, Joseph: *See*—
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Redpath, Diane L., 4,392,617, Cl. 239-290.000.

Fung, Anthony K., to Sperry Corporation. Data recovery method and apparatus using variable window. 4,393,458, Cl. 364-900.000.

Funk, Gary L., to Phillips Petroleum Company. Constraint control of a fractional distillation process. 4,392,877, Cl. 62-37.000.

Funk, Robert C.: *See*—
Bachman, Wesley J.; and Funk, Robert C., 4,392,611, Cl. 239-74.000.

Furga, Giulio S. Method of making dresses for dolls and the like and product obtained by this method. 4,392,257, Cl. 2-105.000.

Furukawa, Shunsuke: *See*—
Tanaka, Masato; Furukawa, Shunsuke; Iwamoto, Ikuo; and Doi, Toshitada, 4,393,502, Cl. 371-40.000.

Furuta, Hiroyuki: *See*—
Watai, Haruhisa; Furuta, Hiroyuki; and Kawamoto, Akira, 4,393,120, Cl. 428-457.000.

Fushida, Masao: *See*—
Yoshinaka, Satoru; Fushida, Masao; and Kimoto, Tatsuzi, 4,393,143, Cl. 501-89.000.

Fussl, Erwin; and Berger, Norbert, to Maerz Ofenbau AG. Calcining furnace with gas-permeable wall structure. 4,392,821, Cl. 432-96.000.

Futer, Rudolph E., to Futerized Systems, Inc. Surface flow air conveyor with plenum mounted fan wheel. 4,392,760, Cl. 406-88.000.

Futerized Systems, Inc.: *See*—
Futer, Rudolph E., 4,392,760, Cl. 406-88.000.

GA Technologies Inc.: *See*—
Dobson, Jesse C.; and Knight, Richard W., Jr., 4,392,988, Cl. 252-455.00R.

Gabel, Eike: *See*—
Blank, Heinz U.; Gabel, Eike; Goldschmitt, Ernst; and Mentzel, Werner, 4,393,234, Cl. 562-475.000.

Gabrielson, Carl E.: *See*—
Ashlock, Robert L.; Gabrielson, Carl E.; Kerr, Douglas P.; Rasmussen, David J.; Stump, Theodore M.; and Thode, Charles W., 4,393,491, Cl. 370-13.000.

Gaines, Albert L., to Combustion Engineering, Inc. Toroidal field coil torque structure. 4,392,918, Cl. 376-133.000.

Gajda, Joseph J., to International Business Machines Corporation. Aluminum-copper alloy evaporated films with low via resistance. 4,393,096, Cl. 427-90.000.

Gaku, Morio; Ikeguchi, Nobuyuki; and Ayano, Satoshi, to Mitsubishi Gas Chemical Company, Inc. Curable cyanate ester/acrylic epoxy ester composition. 4,393,195, Cl. 528-361.000.

Gallot, Jacques R.: *See*—
Mouille, Rene' L.; Gallot, Jacques R.; and Pouradier, Jean-Marc E., 4,392,781, Cl. 416-223.00R.

Galow, Manfred; and Joseph, Horst, to Didier Engineering GmbH. Charging apparatus for coke cooling chambers. 4,392,919, Cl. 202-228.000.

Ganguillet, Claude; Ruedin, Yves; and Sallin, Michel, to Ebauches, S.A. Electrochromic display cell. 4,392,720, Cl. 350-357.000.

Ganssle, Jack L. Drywall construction and article of manufacture therefor. 4,392,336, Cl. 52-417.000.

Ganzi, Gary C.; and Paul, Charles T., to Millipore Corporation. Method and structure for sealing tubular filter elements. 4,392,958, Cl. 210-493.200.

Gardineer, Bayard G.; and Heringes, James A., to Technicare Corporation. Combination vanity screen and patient support couch extension. 4,392,486, Cl. 128-68.000.

Garrett, David L., Jr.; and Cassatta, Joseph C., to Ford Motor Company. Stabilization of electron beam curable compositions for improved exterior durability. 4,393,094, Cl. 427-44.000.

Garrett, David M.; and Robin, Wallace R. Method for treatment of herpetic lesions. 4,393,066, Cl. 424-251.000.

Garrett, William R., Jr., to Ashland Oil, Inc. Enhanced viscosity maintenance and demulsibility in asphalt emulsions. 4,393,155, Cl. 524-60.000.

Gassaway, Gary S.; Richgels, Henry J.; and Foster, James L, to Chevron Research Company. Exploration system and method of determining elastic parameters and subsurface shape of an earth formation so as to indicate likelihood of the formation being an ore, marker rock, economic mineral or the like. 4,393,488, Cl. 367-75.000.

Gast, Theodor; and Binder, Kurt, to Robert Bosch GmbH. Electromagnetic valve with a plug member comprising a permanent magnet. 4,392,632, Cl. 251-65.000.

Gast, Uwe; Hennig, Eberhard; Preuss, Dieter; Taudt, Heinz; and Wellendorf, Klaus, to Dr. -Ing. Rudolf Hell GmbH. Method and apparatus for partial electronic retouching of colors. 4,393,399, Cl. 358-80.000.

Gaudiana, Russell A.; and Kalyanaraman, Palaiyur S., to Polaroid Corporation. Substituted-quaterphenylene polyamide. 4,393,194, Cl. 528-348.000.

Gaudiana, Russell A.: *See*—
Rogers, Howard G.; Gaudiana, Russell A.; Manello, Jeannette S.; and Sahatjian, Ronald A., 4,393,196, Cl. 528-363.000.

Gauvain, Roger; and Kueny, Michel, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Fiber separator for feeding a freed-fiber spinning unit. 4,392,276, Cl. 19-97.000.

Gavagan, James A., to Irvin Industries, Inc. Clevis safety belt buckle. 4,392,280, Cl. 24-230.00A.

Gearhart Industries, Inc.: *See*—
Rankin, E. Edward, 4,392,377, Cl. 73-155.000.

Geary, Carl H., Jr., to Elliott Turbomachinery Co., Inc. Bypass control system. 4,392,345, Cl. 60-39.020.

Gebr. van Capelleveen B.V.: *See*—
Van Capelleveen, Pieter, 4,392,768, Cl. 414-278.000.

Gebruder Weiss KG: *See*—
Kneer, Franz, 4,392,881, Cl. 71-9.000.

Gehmann, Walter. Aiming device. 4,392,723, Cl. 350-407.000.

Gehring, Johann: *See*—
Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, 4,392,936, Cl. 204-213.000.

Geimer, Robert L., to United States of America, Agriculture. Method of pressing reconstituted lignocellulosic materials. 4,393,019, Cl. 264-83.000.

Geis, Hans P.; and Helber, Holger, to U.S. Philips Corporation. Rotating diaphragm for a dynamic pick-up device having a pyroelectric layer. 4,393,403, Cl. 358-113.000.

Geiss, Vernon L.: *See*—
Newton, Richard P.; Harper, Patrick H.; Geiss, Vernon L.; and Jewell, John N., 4,392,501, Cl. 131-300.000.

Genentech, Inc.: *See*—
Crea, Roberto, 4,393,010, Cl. 260-940.000.

General Electric Company: *See*—
Blunt, Thomas O., 4,392,766, Cl. 414-113.000.
Cook, Paul M., 4,392,759, Cl. 403-11.000.
Giles, Harold F., Jr.; and White, Dwain M., 4,393,168, Cl. 525-66.000.
Gurr, George P.; and Hardy, Robert M., 4,393,446, Cl. 364-200.000.
Hepp, Leonard R., 4,393,153, Cl. 523-201.000.
Hess, John M., 4,392,778, Cl. 415-139.000.
Hicks, Frederick E., 4,392,358, Cl. 62-155.000.
Jens, Richard A., 4,393,511, Cl. 378-128.000.
Kellogg, Richard A.; May, John B.; and Johnson, Brian C., 4,393,501, Cl. 371-33.000.
Keyes, Gary S.; Georges, Jean-Pierre J.; and DallaPiazza, Dennis G., 4,393,402, Cl. 358-111.000.
Miller, Kenneth F., 4,393,156, Cl. 524-114.000.
Miller, Kenneth F., 4,393,158, Cl. 524-114.000.
Potter, Ralph M., 4,393,100, Cl. 427-181.000.
Ritzer, Alan; Hajjar, Abraham L.; McEntee, Harry R.; and Shade, Ray W., 4,393,229, Cl. 556-430.000.
Siddiqui, Ehtisham U. A.; Wenzel, James L.; and Butterfield, John L., 4,392,835, Cl. 464-32.000.
Tyrell, John A.; and Freimiller, Gary L., 4,393,190, Cl. 528-170.000.
Van Abeelen, Petrus C. A. M.; and de Munck, Hans, 4,393,161, Cl. 524-506.000.

General Foods Corporation: *See*—
Spradlin, Joseph E.; Morgan, Jeffrey D.; Olson, Allan R.; and Howley, Joseph P., 4,393,085, Cl. 426-28.000.
General Motors Corporation: *See*—
Bock, Gustavus P., 4,393,319, Cl. 310-80.000.
Deckard, John I.; and Straub, Robert D., 4,392,612, Cl. 239-88.000.
Montgomery, Loren N., 4,392,393, Cl. 74-661.000.
Shakespear, Horacio, 4,392,667, Cl. 280-690.000.
Shows, Everett W., 4,392,347, Cl. 60-39.270.
Verdouw, Albert J., 4,392,355, Cl. 60-752.000.
Wong, Tom C., 4,392,583, Cl. 220-202.000.
General Signal Corporation: *See*—
Bowden, Charles J., 4,392,798, Cl. 418-102.000.
Genese, Joseph N.: *See*—
Elias, Allen M.; and Genese, Joseph N., 4,392,850, Cl. 604-82.000.
George, Robert D.; and di Palma, Georgio, to Sherwood Medical Company. Wound drainage device. 4,392,858, Cl. 604-187.000.
Georges, Jean-Pierre J.: *See*—
Keyes, Gary S.; Georges, Jean-Pierre J.; and DallaPiazza, Dennis G., 4,393,402, Cl. 358-111.000.
Geosource Inc.: *See*—
Fassauer, Arthur L., 4,392,591, Cl. 222-227.000.
Gerber, Bernard R.: *See*—
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,392,576, Cl. 215-1.00C.
Gesellschaft fur Biotechnologische Forschung: *See*—
Wagner, Fritz; Lindorfer, Walter; Jahn-Held, Wilhelm; and Schulz, Walther, 4,392,892, Cl. 134-25.100.
Gessler, Donald A. Process for erecting a rotor assembly for a rotary extractor and apparatus therefor. 4,393,027, Cl. 422-269.000.
Ghaussy, Rahmat U. Erythrocyte sedimentation rate apparatus and method. 4,392,497, Cl. 128-637.000.
Ghestem, Gerard: *See*—
Henin, Jean-Pierre; and Ghestem, Gerard, 4,392,890, Cl. 106-100.000.
Ghica, Grigore-Vlad: *See*—
Glashauser, Walter; and Ghica, Grigore-Vlad, 4,393,129, Cl. 430-296.000.
Giannone, Victor S. Simplified adjustable tire chain. 4,392,521, Cl. 152-218.000.
Gidge, Kenneth N.; and Richard, Henry J., to BSL Corporation. Strip curtain for display type refrigerators. 4,392,360, Cl. 62-249.000.
Gielis, Gerardus C. M.: *See*—
Claasen, Theodoor A. C. M.; Gielis, Gerardus C. M.; Schmidt, Johan M.; and Schoonheijm, Harry B., 4,393,273, Cl. 179-1.0GD.
Giffen, William M., Jr.: *See*—
Li, George S.; Jones, John F.; and Giffen, William M., Jr., 4,393,020, Cl. 260-108.000.
Giglia, Robert D.; and Haacke, Gottfried, to American Cyanamid Company. Electrochromic cell having a mixed solid ion-conducting layer. 4,392,721, Cl. 350-357.000.
Giles, Harold F., Jr.; and White, Dwain M., to General Electric Company. Blends of polyetherimides and rubber modified vinyl aromatic polymers. 4,393,168, Cl. 525-66.000.
Gilker, Clyde, to McGraw-Edison Company. Overcurrent relay circuit. 4,393,431, Cl. 361-97.000.
Gill, Graham P., to Motorola, Inc. Method for controlling the conductivity of polyimide films and improved devices utilizing the method. 4,393,092, Cl. 427-38.000.
Gillespie, Ralph, to Milliken Research Corporation. Meat packaging material. 4,393,114, Cl. 428-252.000.
Girgis, Mikhail M., to PPG Industries, Inc. Method of preparing a phenolic aldehyde resin and resin composition for an adhesive system to be applied to glass fibers. 4,393,189, Cl. 528-155.000.
Glaser, David. Electron acceleration in ionizable gas. 4,393,334, Cl. 315-167.000.
Glashauser, Walter; and Ghica, Grigore-Vlad, to Siemens Aktiengesellschaft. Method of stress-free development of irradiated polymethylmetacrylate. 4,393,129, Cl. 430-296.000.
Glebov, Vladimir P.; Krivtsov, Georgy V.; Danchenkov, Jury V.; Khukhry, Sergei A.; and Schepotin, Sergei G. Feeder of bulk materials. 4,392,567, Cl. 198-544.000.
Glietenberg, Helmut: *See*—
Engelbach, Heinz; Steigleiter, Werner; and Glietenberg, Helmut, 4,392,984, Cl. 252-432.000.
Godfrey, Thomas E., to Milliken Research Corporation. Flow controller. 4,392,366, Cl. 68-205.00R.
Goedert, Jean, to Arbed S.A. Method of desulfurizing an iron melt. 4,392,887, Cl. 75-58.000.
Goertzen, Gerold G., to Roper Corporation. Adjustable handle assembly for walk-behind garden implement. 4,392,538, Cl. 180-19.00R.
Goetsch, Duane A.: *See*—
Howard, Kent A.; and Goetsch, Duane A., 4,392,945, Cl. 208-210.000.
Gold Star Company, Ltd.: *See*—
Lee, Hyun C., 4,392,756, Cl. 400-144.200.
Goldberg, Erwin, to Northwestern University. Antigenic peptide compounds. 4,392,997, Cl. 260-112.50R.
Goldberg, Stuart D.: *See*—
Besen, Peter D.; Shulsinger, Don H.; and Goldberg, Stuart D., 4,393,277, Cl. 179-2.00A.
Goldschmitt, Ernst: *See*—
Blank, Heinz U.; Gabel, Eike; Goldschmitt, Ernst; and Mentzel, Werner, 4,393,234, Cl. 562-475.000.
Goldstein, Bernard; Dresner, Joseph; and Szostak, Daniel J., to RCA Corporation. Method and apparatus for determining minority carrier diffusion length in semiconductors. 4,393,348, Cl. 324-158.00R.
Golebieski, William J. Floor hockey carom corner. 4,392,647, Cl. 272-3.000.
Golyak, Leonty A.: *See*—
Golyak, Oleg L.; Golyak, Leonty A.; and Stepurenko, Ivan R., 4,392,805, Cl. 425-206.000.
Golyak, Oleg L.; Golyak, Leonty A.; and Stepurenko, Ivan R. Centrifugal casting apparatus. 4,392,805, Cl. 425-206.000.
Gomi, Shintaro: *See*—
Yokogawa, Tomoshisa; and Gomi, Shintaro, 4,393,513, Cl. 455-243.000.
Gonek, Stanislaw M.: *See*—
Stewart, John S.; and Gonek, Stanislaw M., 4,393,291, Cl. 200-148.00R.
Gonella, Jacques, to Refarmed S.A. Thiolic derivatives or erythromycin having therapeutic activity and pharmaceutical compositions containing them. 4,393,053, Cl. 424-180.000.
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, to Shell Oil Company. Olefin polymerization process with novel supported titanium catalyst compositions. 4,393,182, Cl. 526-125.000.
Goodall Rubber Company: *See*—
Jones, Robert T.; and Harrison, Martin B., 4,392,676, Cl. 285-61.000.
Goodnough, Douglas D., to Burlington Industries, Inc. Drive for loom easer bar. 4,392,516, Cl. 139-115.000.
Goodyear Tire & Rubber Company, The: *See*—
Deregibus, Alfio, 4,393,099, Cl. 427-177.000.
Tyler, Keith A.; and Fix, Sidney R., 4,393,154, Cl. 524-12.000.
Gordon, Alvina A., and Emma C. Cnudde Administratrices: *See*—
Gordon, Edmund A., deceased; and Yaecker, John, Administrator, 4,392,344, Cl. 59-78.100.
Gordon, Edmund A., deceased (by Gordon, Alvina A., and Emma C. Cnudde Administratrices); and by Yaecker, John, Administrator, to Central Safety Equipment Company. Chain-link cable carrier. 4,392,344, Cl. 59-78.100.
Gorenflo, Donald L.; and Noblit, William D., III, to Fairchild Engineering Company, The. Method and apparatus for dimensionally measuring articles. 4,393,401, Cl. 358-107.000.
Goshgarian, Robert A. Palatal arch bar with combination locking device and elastic anchor. 4,392,826, Cl. 433-7.000.
Goto, Kunihiko: *See*—
Takahashi, Masayuki; Goto, Kunihiko; Tanaka, Hisami; and Ohata, Michinobu, 4,393,318, Cl. 307-353.000.
Goto, Mitsuhiro: *See*—
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Goto, Takashi: *See*—
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Gottesman, Jerome D.: *See*—
Volpe, Gerald T.; Laskoski, Leonard S.; Amodeo, Ralph J.; Swanson, William J.; and Gottesman, Jerome D., 4,393,352, Cl. 329-50.000.
Gottlieb, Klaus; Bruderreck, Hartmut; and Wehmeier, Friedel-Heinrich, to Veba Oel AG. Process for producing alcohols and ethers. 4,393,250, Cl. 568-697.000.
Goudie, Alexander C.: *See*—
Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., 4,393,079, Cl. 424-331.000.
Gradl, David A.: *See*—
Linnenbrink, Thomas E.; and Gradl, David A., 4,393,357, Cl. 333-165.000.
Graff, Hart F.; and Bagdal, Karl T., to Armco Inc. Discharge gap cleaning device. 4,392,613, Cl. 239-115.000.
Gras, Gilbert J.: *See*—
Leveque, Jean-Luc M.; and Gras, Gilbert J., 4,392,498, Cl. 128-665.000.
Graser, Reinhold: *See*—
Metzger, Adolf; Konrad, Rolf; and Graser, Reinhold, 4,393,033, Cl. 423-388.000.
Greco, Saverio G.: *See*—
Audeh, Costandi A.; and Greco, Saverio G., 4,392,947, Cl. 208-229.000.
Greenberg, Charles B., to PPG Industries, Inc. Chemical vapor deposition of vanadium oxide coatings. 4,393,095, Cl. 427-87.000.
Greenspan, Donald J. Apparatus for closing tubes. 4,392,807, Cl. 425-393.000.
Gregorian, Roubik; and Wegner, Glenn, to American Microsystems, Inc. Offset compensation for switched capacitor integrators. 4,393,351, Cl. 328-127.000.
Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. 4,393,289, Cl. 200-147.00R.
Greschner, Johann; Kraus, Georg; and Schmid, Gerhard E., to International Business Machines Corporation. Structure with a silicon body having through openings. 4,393,127, Cl. 430-5.000.
Gresser, Herbert D.; Kaplan, George; and Nussenbaum, Joseph, to Lazare Kaplan & Sons, Inc. Method and apparatus for placing identifying indicia on the surface of precious stones including diamonds. 4,392,476, Cl. 125-30.00R.
Griat, Jacqueline: *See*—
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Grieger, Dieter: *See*—
Beisswenger, Siegfried; Boppel, Wolfgang; and Grieger, Dieter, 4,393,295, Cl. 219-121.0EJ.

Grill, Werner, to Saurer-Allma GmbH. Twisting machine. 4,392,341, Cl. 57-90.000.

Groenendal, Ronald C.: *See*—
Stricker, George O.; Teumer, Karl H.; and Groenendal, Ronald C., 4,393,117, Cl. 428-352.000.

Grosse, Aristid V.; and Cherry, Norman H., to Lanko, Inc. Hydrocarbon-water fuels, emulsions, slurries and other particulate mixtures. 4,392,865, Cl. 44-51.000.

Groth, Hugh F.; and Vogel, John D., to Wooster Brush Company, The. Portable paint sprayer. 4,392,614, Cl. 239-215.000.

Grout, Kenneth M., to Kenmartin Development, Inc. Method and apparatus for recovering silver and plastic from used film. 4,392,889, Cl. 75-97.00A.

Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, to Robert Bosch GmbH. Electrode for ignition systems. 4,393,282, Cl. 200-19.00R.

GTE Automatic Electric Incorporated: *See*—
Krzeptowski, Andrzej J., 4,392,290, Cl. 29-239.000.

GTE Products Corporation: *See*—
Belttary, Harold E., 4,393,288, Cl. 200-144.00R.
Marshall, Harry L.; and Schwartz, Alan R., 4,393,118, Cl. 428-403.000.

GTE Sylvania Incorporated: *See*—
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Guczi, Csaba: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.

Gudgel, Willard L.: *See*—
Brown, Leon C.; Campbell, Jesse L.; Fitts, Uscoe J.; and Gudgel, Willard L., 4,392,739, Cl. 355-3.0FU.

Guedj, Richard; Dieulesaint, Eugene; and Royer, Daniel, to Thomson-CSF. Marking system using elastic surface waves. 4,393,268, Cl. 178-18.000.

Guerineau, Abel A. J.: *See*—
Berlivet, Marc A.; and Guerineau, Abel A. J., 4,392,339, Cl. 56-192.000.

Guglielmo, Richard J., Sr. Net finishing composition and process for using same. 4,393,102, Cl. 427-243.000.

Gulf & Western Manufacturing Company: *See*—
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Gulyaev, Jury V.: *See*—
Bagdasarian, Alexandr S.; Gulyaev, Jury V.; Fedorets, Vladimir N.; and Kmita, Anatoly M., 4,393,321, Cl. 310-313.00B.

Gummeringer, Henry E. Internal combustion engine with double oscillating pistons. 4,392,458, Cl. 123-18.00R.

Gunnewig, Hubert, to Westfalia Separator AG. Discharge nozzle for centrifugal separator drums. 4,392,845, Cl. 494-1.000.

Gunther, Dieter; Bertsch, Richard; Bottcher, Siegfried; Arnold, Herbert; Schnurle, Hans; and Horbelt, Michael, to Robert Bosch GmbH. Temperature responsive open/closed loop switching for lambda control. 4,392,470, Cl. 123-440.000.

Gurr, George P.; and Hardy, Robert M., to General Electric Company. Routine timer for computer systems. 4,393,446, Cl. 364-200.000.

Gutman, Rodika: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,392,960, Cl. 210-651.000.

Gwinn, Mack W., Jr., to Firepower, Inc. Muzzle attachment for a firearm barrel. 4,392,413, Cl. 89-14.00C.

Gyomrey, Karl M., to Coles Cranes Limited. Tie rope compensation arrangement. 4,392,573, Cl. 212-230.000.

Haacke, Gottfried: *See*—
Giglia, Robert D.; and Haacke, Gottfried, 4,392,721, Cl. 350-357.000.

Haaf, Franz: *See*—
McKee, Graham E.; Haaf, Franz; Hambrecht, Juergen; Benker, Klaus; Stephan, Rudolf; and Breuer, Hans, 4,393,164, Cl. 525-83.000.

Haberle, Norman; Eberle, Otto; and Hafner, Walter, to Consortium fur elektrochemische Industrie GmbH. 2-Alkenyl and 2-alkynyl succinic acid N-(3,5-dichlorophenyl)imides. 4,393,220, Cl. 548-545.000.

Habermann, Helmut; and Brunet, Maurice, to Societe Europenne de Propulsion. Redundant active electromagnetic bearing. 4,392,693, Cl. 308-10.000.

Hachmann, Klaus, to Henkel Kommanditgesellschaft Auf Aktien. Low-phosphate detergent builder salt mixture and process of washing. 4,392,974, Cl. 252-99.000.

Hacke, Joseph F.; and Bazin, Lucas J., to RCA Corporation. Balanced modulator with feedback stabilization of carrier balance. 4,393,395, Cl. 358-23.000.

Hadfield, Frederick C.; and McElroy, Marvin R. Concealed access furniture. 4,392,628, Cl. 248-202.100.

Hafner, Walter: *See*—
Haberle, Norman; Eberle, Otto; and Hafner, Walter, 4,393,220, Cl. 548-545.000.

Haga, Tsunehiro: *See*—
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Hage, Manfred; Demuth, Hans; and Junker, Otto, to Wieland Werke AG. Concentric tube heat exchanger with spacer. 4,392,526, Cl. 165-154.000.

Hagen, Glenn E. Spaced apart wave generator float array. 4,392,349, Cl. 60-500.000.

Haginoya, Mitsuo: *See*—
Kanamaru, Hisanobu; Tohkairin, Akira; Tatsumi, Hideo; Asahi, Naotatsu; and Haginoya, Mitsuo, 4,392,296, Cl. 29-520.000.

Hagiwara, Miyuki: *See*—
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Hagiwara, Noriaki: *See*—
Ida, Michiaki; Hagiwara, Noriaki; Yamago, Naoyoshi; Yoshioka, Masahiro; and Kikuchi, Katsuaki, 4,392,751, Cl. 384-99.000.

Hagopian, Nubar: *See*—
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Hagqvist, Peter: *See*—
Almlof, Goran; and Hagqvist, Peter, 4,392,871, Cl. 55-23.000.

Hahn, Eberhard. Method of and device for adjusting a shaped-electron-beam working device. 4,393,310, Cl. 250-398.000.

Hahn, Erwin: *See*—
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Hajjar, Abraham L.: *See*—
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Hakansson, Sven, to Axel Johnson Engineering AB. Apparatus for removing liquid from a suspension. 4,392,422, Cl. 100-118.000.

Hale, Raymond L., to Power Hybrids, Incorporated. Hybrid transistor. 4,393,392, Cl. 357-74.000.

Hall, Alfred E., to Sigalos & Levine, P.C. Electronic logic game. 4,392,651, Cl. 273-153.00R.

Hall, Charles P.; and Johenning, John B., to Monterey Manufacturing, Inc. Air bleeder valve for waterbed mattresses. 4,392,872, Cl. 55-36.000.

Hall, James R.; and Whallon, William P., Jr., to Bendix Corporation, The. Electrical conductor having an integral electrical contact. 4,392,703, Cl. 339-49.00R.

Hall, Theodore D.: *See*—
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Haller, John L.: *See*—
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Hamanishi, Yoshinari, to Nippon Kogaku K.K. Lens system capable of short distance photography. 4,392,724, Cl. 350-163.000.

Hambrecht, Juergen: *See*—
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Hamlyn, Maxwell C.: *See*—
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Hammond, David C.; Elchenko, Stephen M.; Tralies, John M.; Verburgt, Peter W.; and Robinson, Leon R., to United States of America, Navy. Test set for a directional command active sonobuoy system (DICASS). 4,393,483, Cl. 367-13.000.

Hanada, Kazunori: *See*—
Sawada, Jiro; Hanada, Kazunori; Tamai, Masaharu; Morimoto, Shigeo; and Omura, Sadafumi, 4,393,228, Cl. 549-549.000.

Hanafi, Nabil, to Pumpenfabrik Urach. Valve arrangement for venting conduits and pumping system including the same. 4,392,784, Cl. 417-103.000.

Hanaoka, Takatsugu: *See*—
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Hancock, Kevin J., II: *See*—
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Handl, Werner, to Staedtler, J. S. Eraser and process for its manufacture. 4,393,022, Cl. 264-148.000.

Hannes, John S.; and Harringer, Robert V., to Western Electric Company, Inc. Device for inserting and removing circuit modules with multiple leads. 4,392,301, Cl. 29-741.000.

Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., to United States of America, Navy. Method for rapidly detecting subterranean tunnels by detecting a non-null value of a resultant horizontal magnetic field component. 4,393,350, Cl. 324-334.000.

Hanshin Sogyo Co., Ltd.: *See*—
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Hanson, Harry T.; and Sapp, John B., Jr., to Celanese Corporation. Synthesis of alkoxy and phenoxy substituted aryl sulfides. 4,393,241, Cl. 568-49.000.

Hara, Kunio, to Nifco, Inc. Apparatus for attachment of carrier sheet to containers. 4,392,337, Cl. 53-48.000.

Hara, Saburo, to Toska Co., Ltd.; Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Method of and apparatus for manufacturing fastener assemblies. 4,392,906, Cl. 156-250.000.

Hara, Toshitami: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,392,907, Cl. 156-252.000.

Harasaki, Hayathugu; and Tsutagawa, Wataru, to Toyo Kogyo Co., Ltd. Engine mounting structure for an automobile body. 4,392,545, Cl. 180-294.000.

Harbaugh, William L.; and Smetana, Raymond S., to Burrell Construction & Supply Co. Method for making a concrete block. 4,393,018, Cl. 264-82.000.

Harding, Brian, to Can-Eng Holdings Limited. Fluidized bed. 4,392,814, Cl. 431-170.000.

Hardouin, Pierre, to La Telemecanique Electrique. Connecting device for pneumatic apparatus. 4,392,677, Cl. 285-137.00R.

Hardy, Robert M.: *See—*
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Hardy, Terence: *See—*
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Hareyama, Kyuichi, to Nippon Electric Co., Ltd. Digital to analog converter using matrix of current sources. 4,393,370, Cl. 340-347.0DA.

Harper, Patrick H.: *See—*
Newton, Richard P.; Harper, Patrick H.; Geiss, Vernon L.; and Jewell, John N., 4,392,501, Cl. 131-300.000.

Harra, David J., to Varian Associates, Inc. Method for obtaining uniform etch by modulating bias on extension member around radio frequency etch table. 4,392,932, Cl. 204-192.00E.

Harra, David J.; and Turner, Frederick T., to Varian Associates, Inc. Radio frequency etch table with biased extension member. 4,392,938, Cl. 204-298.000.

Harringer, Robert V.: *See—*
Hannes, John S.; and Harringer, Robert V., 4,392,301, Cl. 29-741.000.

Harris, Eugene G., to Emery Industries, Inc. Process for the production of macrocyclic esters and lactones utilizing mixed metal catalysts. 4,393,223, Cl. 549-266.000.

Harris, Jeff; Chambers, Charles A.; and Horwitz, Jack M., to Minkey Farms Partnership. Mouth operable mask device. 4,392,324, Cl. 46-1.00F.

Harris, Robert S., to Stant Inc. Two-stage pressure relief valve. 4,392,507, Cl. 137-38.000.

Harrison, Martin B.: *See—*
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Harry, Ieuan L.: *See—*
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Hart, Cornelis M.; and Lohstroh, Jan, to U.S. Philips Corporation. Memory cell arrangement for a static memory. 4,393,471, Cl. 365-154.000.

Hartmann, Frederick D.: *See—*
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Hartmann, Werner, to Harwe AG. Process for producing molded articles from polylactams by activated anionic polymerization of medium lactams. 4,393,193, Cl. 528-326.000.

Hartness International, Inc.: *See—*
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Hartness, Thomas P.: *See—*
Hartness, Thomas S.; and Hartness, Thomas P., 4,392,586, Cl. 221-210.000.

Hartness, Thomas S.; and Hartness, Thomas P., to Hartness International, Inc. Apparatus for securing cartons on the top of articles carried in a case. 4,392,586, Cl. 221-210.000.

Hartshorn, Angus J.; and Jones, Eric, to Imperial Chemical Industries PLC. Transition metal composition, production and use. 4,392,983, Cl. 252-429.00B.

Hartwell, Edward W.: *See—*
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Hasegawa, Kayoko: *See—*
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Hassall, Cedric H.: *See—*
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Hatakeyama, Hideo: *See—*
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Hathaway, Roderick D.; Irving, Edward; and Waterhouse, John S., to Ciba-Geigy Corporation. Photopolymerizable resins. 4,392,930, Cl. 204-159.140.

Hattori, Mitsutoshi: *See—*
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Hauk, Ernest D.; and Addison, William C., to Hawk Industries, Inc. Water well developing system. 4,392,527, Cl. 166-55.200.

Havers, James S.: *See—*
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Hawk Industries, Inc.: *See—*
Hauk, Ernest D.; and Addison, Willi..n C., 4,392,527, Cl. 166-55.200.

Haws, John R., to Phillips Petroleum Company. Polymeric blends. 4,393,170, Cl. 525-89.000.

Hayakawa, Masaharu: *See—*
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Hayama, Toru: *See—*
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Hayashi, Hiroshi; Shimojima, Yukiji; Shirai, Takashi; Ishida, Torao; and Shibukawa, Mitsuru, to Asahi Kasei Kogyo Kabushiki Kaisha. AI-77 Compounds and pharmaceutically acceptable salts thereof. 4,393,225, Cl. 549-289.000.

Hayashi, Yukichi, to Kabushiki Kaisha Nippon Coinco. Total sales summing device for a vending machine. 4,392,564, Cl. 194-1.00N.

Hayden, Gary N. Combined single and double water ski tow bar. 4,392,833, Cl. 441-69.000.

Heat & Control, Inc.: *See—*
Caridis, Andrew A.; and Benson, Clark K., 4,392,420, Cl. 99-406.000.

Heck, Richard M.: *See—*
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Heckman, Richard A., to United States of America, Energy. Molten tin reprocessing of spent nuclear fuel elements. 4,392,995, Cl. 252-627.000.

Heckmann, Horst; and Nawroth, Werner, to Friedrich W. Schwing, GmbH. Control valve for viscous material pumps. 4,392,510, Cl. 137-454.200.

Heibel, Helmut, to Lucas Industries Limited. Actuator mechanisms for vehicle brakes. 4,392,558, Cl. 188-72.700.

Heidemeyer, Paulus: *See—*
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Heidt-Cizerle, Trude-Helga. Device for displaying and marking foods or the like. 4,392,571, Cl. 206-557.000.

Heimala, Seppo O.; Hultholm, Stig E.; and Tuovinen, Frans H., to Outokumpu Oy. Process for the production of an iron-free chromium (III) compound. 4,393,029, Cl. 423-55.000.

Heiman, Robert B., to Astro-Steel Grip International, Inc. Flexible cementitious coatings. 4,392,335, Cl. 52-309.170.

Heiss, Werner: *See—*
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Heja, Gergely: *See—*
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.

Helber, Holger: *See—*
Geis, Hans P.; and Helber, Holger, 4,393,403, Cl. 358-113.000.

Helbing, Clarence H. Method and apparatus for applying a patch. 4,392,900, Cl. 156-153.000.

Helfrich, Elaine A.; and Yip, Kin F., to Miles Laboratories, Inc. Stabilized Romanowsky stain solution. 4,392,864, Cl. 8-506.000.

Henderson, Esther G.; and Mallet, Inger V. Cosmetic composition. 4,393,045, Cl. 424-95.000.

Henin, Jean-Pierre; and Ghestem, Gerard, to Fives-Cail Babcock. Cement clinker production. 4,392,890, Cl. 106-100.000.

Henke, Werner. Process for efficiently removing oxides of nitrogen from exhaust gas. 4,393,031, Cl. 423-239.000.

Henkel Kommanditgesellschaft Auf Aktien: *See—*
Altenschopfer, Theodor; and Schumann, Klaus, 4,392,977, Cl. 252-174.190.
Fischer, Herbert; Budnowski, Manfred; and Zeidler, Ulrich, 4,393,060, Cl. 424-248.500.
Hachmann, Klaus, 4,392,974, Cl. 252-99.000.

Hennig, Eberhard: *See—*
Gast, Uwe; Hennig, Eberhard; Preuss, Dieter; Taudt, Heinz; and Wellendorf, Klaus, 4,393,399, Cl. 358-80.000.

Hepp, Leonard R., to General Electric Company. Impact modified glass/mineral reinforced polyester blends. 4,393,153, Cl. 523-201.000.

Heraeus Elektroden GmbH: *See—*
Fabian, Peter; and Muller, Theo, 4,392,927, Cl. 204-98.000.

Heraeus Quarzschmelze GmbH: *See—*
Bonewitz, Hans-Ulrich; Muhlich, Albert; and Rau, Karlheinz, 4,392,715, Cl. 350-96.330.

Herbstman, Sheldon: *See—*
Estes, John H.; and Herbstman, Sheldon, 4,392,946, Cl. 208-217.000.

Herchenbach, Horst: *See—*
Brachthauser, Kunibert; and Herchenbach, Horst, 4,392,822, Cl. 432-106.000.

Heringes, James A.: *See—*
Gardineer, Bayard G.; and Heringes, James A., 4,392,486, Cl. 128-68.000.

Herold, Wolf-Dietrich, to ESPE Fabrik Pharmazeutischer Preparate GmbH. Multiple-tube dispenser. 4,392,589, Cl. 222-137.000.

Herrera, Jose E.: *See—*
Laine, Norman R.; and Herrera, Jose E., 4,392,987, Cl. 252-448.000.

Herriau, Paul, to Societe SOGEFINA, Societe de Gestion Financiere Armoricaine. Pneumatic transport device particularly for single-seed seed drill. 4,392,439, Cl. 111-34.000.

Herrington, Fox J., to Mobil Oil Corporation. Manufacturing process for channel seal. 4,392,897, Cl. 156-66.000.

Hess, John M., to General Electric Company. Double flow reheat diaphragm. 4,392,778, Cl. 415-139.000.

Hesston Corporation: *See—*
Berlivet, Marc A.; and Guerinesu, Abel A. J., 4,392,339, Cl. 56-192.000.

Heuvelsland, Albert; Jans, Fritz F. F.; and de Block-Martens, Greet, to Dow Chemical Company, The. Process for removing alkynes from C_4 hydrocarbon mixtures. 4,393,249, Cl. 568-688.000.

Heymer, Gero: *See—*
Lehr, Klaus; Heymer, Gero; May, Christian; and Klein, Hermann, 4,392,962, Cl. 210-688.000.

Hibi, Hitoshi: *See*—
Kondo, Nobuo; Naganoma, Masanori; Hibi, Hitoshi; Fujii, Tetsuo; and Suzuki, Kunihiko, 4,393,365, Cl. 340-57.000.
Hicks, Frederick E., to General Electric Company. Apparatus and method of detecting failure in a refrigerator defrost system. 4,392,358, Cl. 62-155.000.
Hicks, William O.: *See*—
Lagus, Peter L.; Peterson, Edward W.; and Hicks, William O., 4,392,376, Cl. 73-155.000.
Higaki, Yuzo: *See*—
Takada, Atsunobu; and Higaki, Yuzo, 4,393,044, Cl. 424-59.000.
Highlander, Sarah K.: *See*—
Manis, Jack J.; and Highlander, Sarah K., 4,393,137, Cl. 435-172.000.
Higuchi, Chojiro: *See*—
Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, 4,393,000, Cl. 260-239.00E.
Hill, Phillip D.: *See*—
Tusinski, Joseph; and Hill, Phillip D., 4,392,334, Cl. 51-263.000.
Hill, Robert B., to Eye-D Development II Ltd. Rotating beam ocular identification apparatus and method. 4,393,366, Cl. 382-2.000.
Hillberg, Robert L.; and Stevens, Frederick F. Trigger retaining and stabilizing means. 4,392,320, Cl. 42-69.00R.
Hiltebrandt, Siegfried, to Richard Wolf GmbH. Endoscope. 4,392,485, Cl. 128-6.000.
Hilton, Carl W., to Return on Investment Corporation. Tennis training aid. 4,392,650, Cl. 273-29.00A.
Hirai, Ayahiro: *See*—
Okuma, Kiwamu; Haga, Tsunehiro; Kizara, Masao; Otaki, Keiji; and Hirai, Ayahiro, 4,392,878, Cl. 65-6.000.
Hirai, Toshio; and Goto, Takashi. Electrically conductive Si_3N_4-C series amorphous material and a method of producing the same. 4,393,097, Cl. 427-94.000.
Hiraiwa, Kazuyoshi; and Yamasaki, Saburo, to Nissan Motor Co., Ltd. Transmission switch arrangement for a power transmission responsive to shifting of gear position. 4,393,285, Cl. 200-61.880.
Hiramatsu, Uji: *See*—
Nakagawa, Tsuneo; Hiramatsu, Uji; and Honda, Toshihide, 4,393,257, Cl. 570-145.000.
Hiramoto, Shinji: *See*—
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Hirashima, Tsuneaki; Miyata, Toshiyuki; Yamamoto, Yoshikazu; and Kato, Mitsuyuki, to Showa Chemical Co., Ltd.; and Osaka Municipal Government. Method of producing aminobenzimidazolones. 4,393,216, Cl. 548-305.000.
Hirata, Sadao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; Hirata, Sadao; Yazaki, Jinichi; and Sakano, Kozaburo, 4,393,106, Cl. 428-35.000.
Hirata, Shinji; and Ina, Hirohiko, to West Electric Co., Ltd. Electronic flash device. 4,393,335, Cl. 315-241.00P.
Hirayama, Noriaki: *See*—
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Hirosaki, Yukihiro: *See*—
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Hirth, Georges: *See*—
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Hirukawa, Kohei: *See*—
Torii, Michihiro; Hirukawa, Kohei; Urata, Hiroshi; and Suzuki, Shinichi, 4,393,373, Cl. 340-384.00E.
Hisaka Works, Ltd.: *See*—
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Hisamitsu Pharmaceutical Co., Inc.: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Tetsuya; and Ide, Hiroyuki, 4,393,076, Cl. 424-317.000.
Hitachi Chemical Company, Ltd.: *See*—
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.
Hitachi Koki Co., Ltd.: *See*—
Matsuda, Yasumasa; Mukumoto, Kyoji; Sagae, Syoji; and Kasahara, Masatoshi, 4,393,388, Cl. 346-140.00R.
Nakajima, Isao; Tagusari, Koji; Okuna, Kenji; Hayama, Toru; Takahashi, Kazue; Watanabe, Michihiro; and Kotani, Sumihisa, 4,392,423, Cl. 101-93.480.
Hitachi, Ltd.: *See*—
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Ida, Michiaki; Hagiwara, Noriaki; Yamago, Naoyoshi; Yoshioka, Masahiro; and Kikuchi, Katsuaki, 4,392,751, Cl. 384-99.000.
Ishii, Takeo; Ogata, Masatsugu; and Narahara, Toshikazu, 4,393,177, Cl. 525-422.000.
Kanamaru, Hisanobu; Tohkairin, Akira; Tatsumi, Hideo; Asahi, Naotatsu; and Haginoya, Mitsuo, 4,392,296, Cl. 29-520.000.
Kumada, Akio; Ihochi, Takahiko; Homma, Makoto; and Tanaka, Masashi, 4,392,747, Cl. 368-88.000.
Maki, Naoki; Numata, Seiji; Yamaguchi, Kiyoshi; and Yamamoto, Heroe, 4,393,429, Cl. 361-19.000.
Matsuda, Yasumasa; Mukumoto, Kyoji; Sagae, Syoji; and Kasahara, Masatoshi, 4,393,388, Cl. 346-140.00R.
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Koji; and Suzuki, Mitsuo, 4,393,342, Cl. 318-467.000.
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Sakudo, Noriyuki; Tokiquchi, Katsumi; Koike, Hidemi; Kanomata, Ichiro; and Nakashima, Humihiko, 4,393,333, Cl. 315-111.810.
Shibuya, Yoshimichi; and Takahashi, Masami, 4,392,717, Cl. 350-334.000.
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Ho, Nelson; and Kratochvil, Jiri, to Critikon, Inc. System for encapsulation of semiconductor chips. 4,393,130, Cl. 430-313.000.
Hobart Corporation: *See*—
Meyers, Theodore F., 4,392,891, Cl. 134-10.000.
Hoechst Aktiengesellschaft: *See*—
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Merkel, Wulf; Bormann, Dieter; Mania, Dieter; and Muschaweck, Roman, 4,393,072, Cl. 424-275.000.
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Hoehn, Wolfgang, to ITT Industries, Inc. Parallel analog-to-digital converter. 4,393,372, Cl. 340-347.0AD.
Hofbauer, Peter; Scholz, Romanus; Heidemeyer, Paulus; and Zimmermann, Frank, to Volkswagenwerk Aktiengesellschaft. Engine-gear arrangement for vehicles, in particular passenger cars. 4,392,394, Cl. 74-689.000.
Hoffman, Jerzy. Wire trimmer. 4,392,398, Cl. 81-9.510.
Hoffman, John G.: *See*—
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,393,350, Cl. 324-334.000.
Hoffman, Werner; von Fraunberg, Karl; and Baumann, Manfred, to BASF Aktiengesellschaft. Musk-like scents and their manufacture. 4,393,245, Cl. 568-375.000.
Hoffmann, Dietrich: *See*—
Mittelbach, Gunter; Horstmann, Gunter; Heiss, Werner; Hoffmann, Dietrich; Siebrecht, Gunter; Kriechbaum, Karl; and Rapp, Gunter, 4,393,290, Cl. 200-148.00A.
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Boguth, Walter; and Hirth, Georges, 4,393,057, Cl. 424-229.000.
Boguth, Walter; and Hirth, Georges, 4,393,073, Cl. 424-284.000.
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,393,221, Cl. 549-39.000.
Keith, Dennis D.; Tengi, John P.; and Weigele, Manfred, 4,393,003, Cl. 260-245.20R.
Lohri, Bruno, 4,393,243, Cl. 568-344.000.
Hofmann-Igl, Ernest, to Basotherm GmbH. Eye drop dispensing bottle. 4,392,590, Cl. 222-174.000.
Hofmann, Rolf L., to Advanced Card Systems, Ltd. Apparatus and method for reading punched cards. 4,393,302, Cl. 235-474.000.
Hoglinger, Norbert. Device for facilitating particularly the loading and unloading of containers etc. from vehicles etc. 4,392,662, Cl. 280-43.230.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Drying apparatus. 4,392,310, Cl. 34-172.000.
Hokkaido University, President of: *See*—
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Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Take-off connector for security circuit. 4,392,707, Cl. 339-125.00R.
Holcomb, Dysart E.: *See*—
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Sardisco, John B.; and Holcomb, Dysart E., 4,393,030, Cl. 423-167.000.
Holman, Lee. Brake mechanism for material handling system. 4,392,563, Cl. 193-10.000.
Holmes, David D., to RCA Corporation. Television ghost signal detector with color burst phase delay control. 4,393,397, Cl. 358-36.000.
Holmes, Paul A.; Willmouth, Frank M.; and Newton, Alan B., to Imperial Chemical Industries PLC. Polymer blends containing polymer of β-hydroxybutyric acid and chlorine or nitrile group containing polymer. 4,393,167, Cl. 525-64.000.
Holmes, Paul M.: *See*—
Crissy, Charles F.; and Holmes, Paul M., 4,392,762, Cl. 410-116.000.
Holtey, Thomas O.; Noyes, Steven S.; and Peters, Daniel G., to Honeywell Information Systems Inc. Communications subsystem having a self-latching data monitor and storage device. 4,393,461, Cl. 364-900.000.
Homma, Makoto: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Iwai, Kazuhiro; Enomoto, Hiroshi; Enokimoto, Akito; and Kato, Yoshitaka, 4,392,536, Cl. 180-217.000.
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Hong, Enrique: *See*—
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Honjo, Satoru; Yuyama, Yasuaki; Iwasa, Masakazu; and Imanishi, Kazuo, to Fuji Photo Film Co., Ltd. Transfer powder marking method using a core-shell powder comprising a pigment, solvent-insoluble polyester resin and a volatile halogenated hydrocarbon insoluble ingredient. 4,393,112, Cl. 428-207.000.

Hoover, Lonnie D.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,392,964, Cl. 252-8.50C.

Hoppe, Karl; and Strauss, Udo, to BASF Farben & Fasern A.G. Synthetic resin. 4,393,179, Cl. 525-490.000.

Horbelt, Michael: *See*—
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Horiba, Ltd.: *See*—
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Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, to Dai Nippon Printing Co., Ltd.; and Ikegami Tsushinki Co., Ltd. Apparatus for simulating color printing process. 4,393,398, Cl. 358-76.000.

Horike, Masanori: *See*—
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,393,385, Cl. 346-75.000.

Horner, Joseph L.; and Ludman, Jacques E., to United States of America, Air Force. Method of manufacturing holographic elements for fiber and integrated optic systems. 4,392,709, Cl. 350-3.830.

Horrobin, David F., to Efamol Limited. Treatment for obesity. 4,393,049, Cl. 424-145.000.

Horsley, John K., to Molins Limited. Bobbin changer for joining successive reels of web of the cigarette industry. 4,392,912, Cl. 156-504.000.

Horstmann, Aloys; Eckholt, Heinz; and Veltel, Reinhard, to Volkmann GmbH & Co. Yarn monitor for two-yarn cabling or twisting machine. 4,392,340, Cl. 57-83.000.

Horstmann, Gunter: *See*—
Mittelbach, Gunter; Horstmann, Gunter; Heiss, Werner; Hoffmann, Dietrich; Siebrecht, Gunter; Kriechbaum, Karl; and Rapp, Gunter, 4,393,290, Cl. 200-148.00A.

Horton, Stanley K., to Prem Magnetics, Inc. Variable magnetically biased linearity control. 4,393,361, Cl. 335-212.000.

Horwitz, Jack M.: *See*—
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Hoshino, Takashi: *See*—
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Hoshiyama, Hidetoshi: *See*—
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Hosiden Electronics Co., Ltd.: *See*—
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Hosoi, Fumio: *See*—
Sasaki, Takashi; Hagiwara, Miyuki; Hosoi, Fumio; and Takagi, Tohru, 4,393,165, Cl. 525-10.000.

Hosokawa, Minoru; Ikeda, Masayuki; and Yazawa, Satoru, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display systems. 4,393,380, Cl. 340-805.000.

Hosomizu, Hiroshi: *See*—
Sahara, Masayoshi; Nakai, Masaaki; Ishida, Tokuji; and Hosomizu, Hiroshi, 4,392,727, Cl. 354-43.000.

Hotta, Hisashi: *See*—
Kitamura, Yoichi; and Hotta, Hisashi, 4,392,582, Cl. 220-75.000.

Houle, Howard E. Grain combine with improved straw walker. 4,392,500, Cl. 130-26.000.

Houle, Laurent. Ejecting ice-cream scoop. 4,392,806, Cl. 425-286.000.

House, Roy F.; and Hoover, Lonnie D., to NL Industries, Inc. Compositions and method for thickening aqueous brines. 4,392,964, Cl. 252-8.50C.

Howaldtwerke - Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See*—
Kaps, Hermann, 4,392,447, Cl. 114-230.000.

Howard, Kent A.; and Goetsch, Duane A., to Exxon Research and Engineering Co. Two-stage hydrorefining process. 4,392,945, Cl. 208-210.000.

Howley, Joseph P.: *See*—
Spradlin, Joseph E.; Morgan, Jeffrey D.; Olson, Allan R.; and Howley, Joseph P., 4,393,085, Cl. 426-28.000.

Howmedica, Inc.: *See*—
Huck, Charles M.; Studer, John E.; and Sauer, Philip H., 4,392,860, Cl. 604-212.000.

Hoya Lens Corporation: *See*—
Tarumi, Niro; Komiya, Shigeo; and Sugimura, Mitsuo, 4,393,184, Cl. 526-261.000.

Hoyle, Charles E.; and Lenox, Ronald S., to Armstrong World Industries, Inc. Diazidosulfonyl-N-substituted aniline. 4,393,006, Cl. 260-349.000.

Huang, I-Der: *See*—
Yang, Tai-Cheng; Rao, Krishna K.; and Huang, I-Der, 4,392,986, Cl. 252-435.000.

Hubner, Fritz, to Plascore, Inc. Fluorescent lamp shield. 4,393,323, Cl. 313-110.000.

Huck, Charles M.; Studer, John E.; and Sauer, Philip H., to Howmedica, Inc. Disposable wound drainage device. 4,392,860, Cl. 604-212.000.

Huckins, Charles M.: *See*—
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Hudson, Alice P.: *See*—
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Hug, Duane L.: *See*—
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Hughes, David W.: *See*—
Paulson, Wayne M.; and Hughes, David W., 4,392,992, Cl. 252-512.000.

Hughes, Jack H. Multi-phase failure detector. 4,393,430, Cl. 361-92.000.

Hultholm, Stig E.: *See*—
Heimala, Seppo O.; Hultholm, Stig E.; and Tuovinen, Frans H., 4,393,029, Cl. 423-55.000.

Hummerich, Rainer; Weiss, Wolfram; Merger, Franz; Immel, Guenther; Kraus, Hans-Joachim; and Peters, Karl-Clemens, to BASF Aktiengesellschaft. Alkoxyalkylaminotriazine trans-etherification products. 4,393,207, Cl. 544-196.000.

Huntley, John D.; and Parsons, Raymond L., to International Business Machines Corp. Status reporting with ancillary data. 4,393,459, Cl. 364-900.000.

Hupfer, Leopold: *See*—
Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, 4,393,251, Cl. 568-811.000.

Hurst, Robert N., to RCA Corporation. Time changing system for VTR. 4,393,415, Cl. 360-9.100.

Husain, Syed A., to National Semiconductor Corporation. Distributed force indexing system. 4,392,935, Cl. 204-206.000.

Huttlin, Herbert. Pump or blower, in particular for heating and air-conditioning systems. 4,392,777, Cl. 415-131.000.

Hydro Quebec: *See*—
Roberge, Gerald; and Doyon, Andre, 4,393,157, Cl. 323-355.000.

Iai, Kenichiro, to Yoshida Kogyo K. K. Method for assembling slide fastener stringers. 4,392,291, Cl. 29-408.000.

Ibach, Bernhard. Device for fixing catheters or the like. 4,392,854, Cl. 604-174.000.

Ichihashi, Hiroo: *See*—
Fujino, Hitoshi; Kasoto, Masanobu; and Ichihashi, Hiroo, 4,392,738, Cl. 355-3.0TR.

Ichikawa, Masaru, to Sagami Chemical Research Center. Method for producing methanol. 4,393,144, Cl. 518-715.000.

Ichikawa, Shigeru: *See*—
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Ida, Michiaki; Hagiwara, Noriaki; Yamago, Naoyoshi; Yoshioka, Masahiro; and Kikuchi, Katsuaki, to Hitachi, Ltd. Damped bearing device. 4,392,751, Cl. 384-99.000.

Ide, Hiroyuki: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Tetsuya; and Ide, Hiroyuki, 4,393,076, Cl. 424-317.000.

Igarashi, Yoshiaki: *See*—
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Ihara, Tomomi: *See*—
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Ihochi, Takahiko: *See*—
Kumada, Akio; Ihochi, Takahiko; Homma, Makoto; and Tanaka, Masashi, 4,392,747, Cl. 368-88.000.

Iida, Seiichi: *See*—
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Iijima, Noboru: *See*—
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Iijima, Takashi: *See*—
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,392,933, Cl. 204-403.000.

Iino, Umetarou: *See*—
Nakamura, Teruo; and Iino, Umetarou, 4,392,788, Cl. 417-269.000.

Ikeda, Masayuki, to Kabushiki Kaisha Suwa Seikosha. Synchronizing circuit for matrix television set. 4,393,405, Cl. 358-153.000.

Ikeda, Masayuki: *See*—
Hosokawa, Minoru; Ikeda, Masayuki; and Yazawa, Satoru, 4,393,380, Cl. 340-805.000.

Ikeda, Mitsuo: *See*—
Nakasu, Kei; Ichikawa, Shigeru; Tanaka, Toshihiko; and Ikeda, Mitsuo, 4,392,560, Cl. 188-73.340.

Ikegami Tsushinki Co., Ltd.: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.

Ikeguchi, Nobuyuki: *See*—
Gaku, Morio; Ikeguchi, Nobuyuki; and Ayano, Satoshi, 4,393,195, Cl. 528-361.000.

Ikushima, Hiroshi; Baba, Takaaki; Sagishima, Takayuki; and Tanaka, Masanobu, to Matsushita Electric Industrial Co., Ltd. 3-D TV Systems. 4,393,400, Cl. 358-92.000.
Illinois Tool Works Inc.: *See*—
Mugglestone, Peter R., 4,392,278, Cl. 24-213.00R.
Imai, Fusao: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hideo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,393,016, Cl. 264-53.000.
Imai, Yoshikazu: *See*—
Suzuki, Ichiro; Yasumatsu, Jun; Imai, Yoshikazu; and Motonami, Masanao, 4,392,673, Cl. 280-804.000.
Imai, Yoshio; Nabeta, Yoichi; and Inuzuka, Tadao, to Imai, Yoshio. Capacitance humidity sensor. 4,393,434, Cl. 361-286.000.
Imanishi, Kazuo: *See*—
Honjo, Satoru; Yuyama, Yasuaki; Iwasa, Masakazu; and Imanishi, Kazuo, 4,393,112, Cl. 428-207.000.
Imazeki, Ryoji; and Inoue, Michiya, to Fujitsu Fanuc Limited. Method of modifying data stored in non-volatile memory and testing for power failure occurring during modification. 4,393,500, Cl. 371-13.000.
Immel, Guenther: *See*—
Hummerich, Rainer; Weiss, Wolfram; Merger, Franz; Immel, Guenther; Kraus, Hans-Joachim; and Peters, Karl-Clemens, 4,393,207, Cl. 544-196.000.
Imperial Chemical Industries PLC: *See*—
Brittain, David R.; and Wood, Robin, 4,393,062, Cl. 424-250.000.
Daniels, James A., 4,393,224, Cl. 549-273.000.
Hartshorn, Angus J.; and Jones, Eric, 4,392,983, Cl. 252-429.00B.
Holmes, Paul A.; Willmouth, Frank M.; and Newton, Alan B., 4,393,167, Cl. 525-64.000.
Legras, Roger M. H.; Biebuyck, Jean-Jacques E. R. G.; and Mercier, Jean P., 4,393,178, Cl. 525-437.000.
Mitchell, Alan; and Bailey, Thomas, 4,393,235, Cl. 562-478.000.
Roberts, Norman L.; and Whitaker, Graham, 4,393,214, Cl. 546-345.000.
Ina, Hirohiko: *See*—
Hirata, Shinji; and Ina, Hirohiko, 4,393,335, Cl. 315-241.00P.
Indian Explosives Limited: *See*—
Bhaduri, Sumit; and Mahandru, Madan M., 4,393,244, Cl. 568-360.000.
Industrial Holographics, Inc.: *See*—
Wright, Forrest S.; and Zimmerman, Ted R., 4,392,745, Cl. 356-348.000.
Ing. Rudolf Hell GmbH: *See*—
Beisswenger, Siegfried; Boppel, Wolfgang; and Grieger, Dieter, 4,393,295, Cl. 219-121.0EJ.
Ingram, Gary L., to Spencer Wright Industries, Inc. Multi-stitch cam needle bar shifter for tufting machines. 4,392,440, Cl. 112-79.00A.
Inoue, Hiromitsu: *See*—
Minakuchi, Yoshikazu; Abiko, Toshio; and Inoue, Hiromitsu, 4,393,514, Cl. 455-336.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,393,292, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electrical discharge machining a small and deep hole into or through a workpiece. 4,393,292, Cl. 219-69.00M.
Inoue, Koji; Sato, Nobukatsu; and Tamura, Takashi, to Maruishi Pharmaceutical Co., Ltd. Salt of chlorhexidine. 4,393,219, Cl. 548-534.000.
Inoue, Michiya: *See*—
Imazeki, Ryoji; and Inoue, Michiya, 4,393,500, Cl. 371-13.000.
Inoue, Nobuyoshi; and Kishi, Tomomi, to Toyota Jidosha Kabushiki Kaisha. Resistance welding machine. 4,393,293, Cl. 219-90.000.
Inoue, Shojiro: *See*—
Tanaka, Eiichi; Ishibasi, Noboru; and Inoue, Shojiro, 4,392,813, Cl. 431-76.000.
Institut Francais du Petrole: *See*—
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dang Vu, Quang, 4,393,151, Cl. 523-130.000.
Euzen, Jean-Paul; Jacquin, Yves; and Van Landeghem, Hugo, deceased, 4,392,943, Cl. 208-152.000.
Institute for Industrial Research & Standards: *See*—
O'Connell, Denis, 4,392,687, Cl. 298-5.000.
Instytut Chemii Nieorganicznej: *See*—
Wrobel, Stanislaw; and Wegrzyn, Ryszard, 4,392,549, Cl. 181-239.000.
International Business Machines Corporation: *See*—
Aiken, John A., Jr., 4,393,463, Cl. 364-900.000.
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Redpath, Diane L., 4,392,617, Cl. 239-290.000.
Bowles, David J.; Clancy, Douglas E.; Johnson, Carl F.; and Neal, Danny M., 4,392,758, Cl. 400-697.100.
Brown, Leon C.; Campbell, Jesse L.; Fitts, Uscoe J.; and Gudgel, Willard L., 4,392,739, Cl. 355-3.0FU.
Denny, Clifford M.; and Warnpler, Charles W., II, 4,392,757, Cl. 400-328.000.
Gajda, Joseph J., 4,393,096, Cl. 427-90.000.
Greschner, Johann; Kraus, Georg; and Schmid, Gerhard E., 4,393,127, Cl. 430-5.000.
Huntley, John D.; and Parsons, Raymond L., 4,393,459, Cl. 364-900.000.
Konheim, Alan G.; Matyas, Stephen M.; and Meyer, Carl H., 4,393,269, Cl. 178-22.080.
Milligan, Charles A.; Videki, Edwin R., II; and Yates, Winston F., 4,393,445, Cl. 364-200.000.
International Coal Refining Company: *See*—
Tao, John C., 4,392,940, Cl. 208-8.0LE.
International Flavors & Fragrances Inc.: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,392,976, Cl. 252-174.110.
Sprecker, Mark A., 4,393,247, Cl. 568-665.000.
International Minerals & Chemical Corp.: *See*—
Brown, Ross G.; Bright, David R.; and Williams, Robert D., 4,393,041, Cl. 424-19.000.
Brown, Ross G.; Bright, David R.; and Williams, Robert D., 4,393,041, Cl. 424-19.000.
International Minerals & Chemicals Corp.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Varnum, Nancy C., 4,393,152, Cl. 523-139.000.
International Remote Imaging Systems: *See*—
Deindoerfer, Fred H.; DeForest, Sherman E.; and Bolz, Gunner, 4,393,466, Cl. 364-415.000.
International Standard Electric Corporation: *See*—
Boute, Raymond T. G., 4,393,469, Cl. 364-900.000.
International Telephone and Telegraph Corporation: *See*—
Edwards, Allan K., 4,393,493, Cl. 370-16.000.
Inuzuka, Tadao: *See*—
Imai, Yoshio; Nabeta, Yoichi; and Inuzuka, Tadao, 4,393,434, Cl. 361-286.000.
Inuzuka, Tsuneki; Murakami, Koichi; Kurita, Kenji; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,392,741, Cl. 355-14.00R.
Iori, Shinichi; Kajiwara, Ikuo; and Jikihara, Kazuo, to Kumiai Chemical Industry Co. Ltd. Herbicidal composition and process. 4,392,883, Cl. 71-93.000.
Ippolito, Joe J. Earth storage structural energy system and process for constructing a thermal storage well. 4,392,531, Cl. 166-278.000.
Irons, Ian B., to Johnson, Matthey & Co., Limited. Forming process. 4,392,292, Cl. 29-421.00R.
Irvin Industries, Inc.: *See*—
Gavagan, James A., 4,392,280, Cl. 24-230.00A.
Irving, Edward: *See*—
Hathaway, Roderick D.; Irving, Edward; and Waterhouse, John S., 4,392,930, Cl. 204-159.140.
Irving, William A.; and Thornton, Robert E., Jr., to Standard Knitting Mills, Inc. Destruction and dye resistant tag; tagged textile article and method of identifying textiles subject to a dyeing and finishing process. 4,392,315, Cl. 40-27.000.
Ischebeck, Klaus. Storage apparatus including conveyor means. 4,392,767, Cl. 414-136.000.
Ishibasi, Noboru: *See*—
Tanaka, Eiichi; Ishibasi, Noboru; and Inoue, Shojiro, 4,392,813, Cl. 431-76.000.
Ishida, Kozo; and Kohsaka, Hiroji, to Horiba, Ltd. Gas analyzer of the fluid modulation type. 4,393,304, Cl. 250-343.000.
Ishida, Noboru; and Watanabe, Harumichi, to Nippon Oil Company, Limited. Metal deactivator and composition containing same. 4,392,968, Cl. 252-51.50R.
Ishida, Tokuji: *See*—
Sahara, Masayoshi; Nakai, Masaaki; Ishida, Tokuji; and Hosomizu, Hiroshi, 4,392,727, Cl. 354-43.000.
Ishida, Torao: *See*—
Hayashi, Hiroshi; Shimojima, Yukiji; Shirai, Takashi; Ishida, Torao; and Shibukawa, Mitsuru, 4,393,225, Cl. 549-289.000.
Ishii, Shigeru: *See*—
Ozawa, Kiyomi; and Ishii, Shigeru, 4,393,213, Cl. 546-298.000.
Ishii, Takeo; Ogata, Masatsugu; and Narahara, Toshikazu, to Hitachi, Ltd. Thermosetting resin composition, process for preparation thereof and cured product thereof. 4,393,177, Cl. 525-422.000.
Ishii, Yoshinori: *See*—
Tokuno, Masateru; Ishii, Yoshinori; and Hoshiyama, Hidetoshi, 4,392,910, Cl. 156-361.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Shimizu, Masami; and Yasunobe, Junji, 4,392,752, Cl. 384-135.000.
Ishimaru, Osamu: *See*—
Miyamoto, Mitsuyasu; Ishimaru, Osamu; and Fukube, Nobuyoshi, 4,392,365, Cl. 68-19.000.
Ishiyama, Jiro: *See*—
Watanabe, Masazumi; Uehara, Mikio; Shimazu, Yoshimi; Ishiyama, Jiro; and Kato, Motohiko, 4,393,083, Cl. 426-15.000.
Ishizuka, Yutaka, to Diesel Kiki Co., Ltd. Swash-plate type compressor having low noise thrust bearings. 4,392,416, Cl. 92-71.000.
ISKRA-SOZD elektrokovinske industrije n.sol.o.: *See*—
Bandelj, Bojan, 4,393,374, Cl. 340-405.000.
Itakura, Fumitada; and Sugamura, Noboru, to Nippon Telegraph and Telephone Public Corporation. Sound synthesizer. 4,393,272, Cl. 179-1.0SA.
Itani, Abdallah M., to Electric Power Research Institute, Inc. Data transmission system and method. 4,393,516, Cl. 455-608.000.
Itaya, Kozo: *See*—
Maekawa, Hideyuki; Hiramoto, Shinji; Itaya, Kozo; Sato, Kokichi; and Nishida, Hirotaka, 4,392,577, Cl. 215-32.000.
Ito, Masazumi; and Shibazaki, Kenji, to Minolta Camera Kabushiki Kaisha. Paper transport control device for use in mechanical arrangement including manual paper feeding mechanism. 4,392,740, Cl. 355-14.0SH.
Ito, Takao, to Dainichi Kogyo Co., Ltd. Gasifying device for liquid fuel burner. 4,392,811, Cl. 431-37.000.
Itoh, Hiroshi: *See*—
Kobashi, Mamoru; and Itoh, Hiroshi, 4,392,468, Cl. 123-339.000.

Itsubo, Junichi; Mori, Fumio; and Sato, Hideki, to Japan Crown Cork Co. Ltd. Container closure having a liner and method for its productios. 4,392,581, Cl. 215-348.000.
ITT Industries, Inc.: *See*—
Franke, Helmut, 4,392,557, Cl. 188-71.900.
Hoehn, Wolfgang, 4,393,372, Cl. 340-347.0AD.
Loreck, Heinz, 4,393,447, Cl. 364-426.000.
Schopper, Bernd, 4,392,511, Cl. 137-493.200.
Schopper, Bernd; Lowe, Derek; Reinartz, Hans-Dieter; and Tandler, Peter, 4,392,691, Cl. 303-6.00C.
ITW Fastex Italia S.p.A.: *See*—
Bassi, Alberto, 4,392,683, Cl. 296-37.900.
Ivanov, Gennady M.: *See*—
Buryakov, Viktor P.; Ivanov, Gennady M.; Kislik, Mikhail I.; Kurgansky, Pavel M.; Shmotkin, Mark B.; and Eikhenvald, Eduard V., 4,392,551, Cl. 184-7.00D.
Ivory, Loretta C.; and Hartmann, Frederick D., to Ivory, Loretta C. Baby cradle. 4,392,261, Cl. 5-101.000.
Iwai, Kazuhiro; Enomoto, Hiroshi; Enokimoto, Akito; and Kato, Yoshitaka, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle. 4,392,536, Cl. 180-217.000.
Iwamoto, Eisaburo: *See*—
Kitagawa, Norihisa; and Iwamoto, Eisaburo, 4,393,475, Cl. 365-201.000.
Iwamoto, Ikuo: *See*—
Tanaka, Masato; Furukawa, Shunsuke; Iwamoto, Ikuo; and Doi, Toshitada, 4,393,502, Cl. 371-40.000.
Iwasa, Masakazu: *See*—
Honjo, Satoru; Yuyama, Yasuaki; Iwasa, Masakazu; and Imanishi, Kazuo, 4,393,112, Cl. 428-207.000.
Iwasaki, Hiroshi, to Fuju Jiko Kabushiki Kaisha. Magnet base for tool. 4,393,363, Cl. 335-288.000.
Iwasaki, Kyuhachiro: *See*—
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,393,385, Cl. 346-75.000.
Iwasama, Teruo; and Tojiki, Hitomi, to Olympus Optical Company Limited. Motor speed control device. 4,393,340, Cl. 318-301.000.
Iwashita, Tomonori; and Fukahori, Hidehiko, to Canon Kabushiki Kaisha. Motor driven rewind device for camera. 4,392,730, Cl. 354-173.000.
Iwata, Masayosi; and Douke, Harumi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electrical switching arrangement. 4,393,280, Cl. 200-4.000.
Izumi, Naoe, to NGK Insulators, Ltd. Sampling device for analyzing gas with high dust content. 4,392,387, Cl. 73-863.210.
J. C. Schumacher Company: *See*—
McMenamin, Joseph C., 4,393,013, Cl. 261-64.00B.
J. I. Case Company: *See*—
Albrecht, Allan J.; and Van Ooyen, Richard C., 4,392,314, Cl. 37-103.000.
J. J. Barker Company Limited: *See*—
Barker, John C.; and McLaughlin, Ivan P., 4,393,108, Cl. 428-44.000.
Jackson, Peter J.: *See*—
Buchanan, David J.; Davis, Richard; and Jackson, Peter J., 4,393,484, Cl. 367-23.000.
Jackson, Tee-Squant-Nee; Vernon, Paul M.; and Schoen, David A., to Boeing Company, The. Method and apparatus for testing systems that communicate over digital buses by transmitting and receiving signals in the form of standardized multi-bit binary encoded words. 4,393,498, Cl. 371-20.000.
Jacquin, Yves: *See*—
Euzen, Jean-Paul; Jacquin, Yves; and Van Landeghem, Hugo, deceased, 4,392,943, Cl. 208-152.000.
Jaedicke, Hagen: *See*—
Tonne, Peter; and Jaedicke, Hagen, 4,393,211, Cl. 546-153.000.
Jahn-Held, Wilhelm: *See*—
Wagner, Fritz; Lindorfer, Walter; Jahn-Held, Wilhelm; and Schulz, Walther, 4,392,892, Cl. 134-25.100.
James Jr., Harry E. Convertible lantern and reflector therefor. 4,393,439, Cl. 362-182.000.
Jameson, James J.; and Beeson, John M., to Cooper Industries, Inc. Multispeed reversible power shift transmission. 4,392,391, Cl. 74-333.000.
Jann, Fritz F. F.: *See*—
Heuvelsland, Albert; Jann, Fritz F. F.; and de Block-Martens, Greet, 4,393,249, Cl. 568-688.000.
Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata, 4,392,441, Cl. 112-158.00B.
Sano, Yasuro, 4,392,442, Cl. 112-275.000.
Japan Atomic Energy Research Institute: *See*—
Sasaki, Takashi; Hagiwara, Miyuki; Hosoi, Fumio; and Takagi, Tohru, 4,393,165, Cl. 525-10.000.
Japan Bano'k Co., Ltd.: *See*—
Hara, Saburo, 4,392,906, Cl. 156-250.000.
Japan Crown Cork Co. Ltd.: *See*—
Itsubo, Junichi; Mori, Fumio; and Sato, Hideki, 4,392,581, Cl. 215-348.000.
Japan Styrene Paper Corporation: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hideo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,393,016, Cl. 264-53.000.
Jarrett, Boaz A.: *See*—
Mowbray, Dorian F.; and Jarrett, Boaz A., 4,392,[illegible], Cl. 123-299.000.
Jarvis, Raymond C. Heat-sink water heater. 4,392,455, Cl. 122-[illegible]0A.
Jasys, Vytautas J., to Pfizer Inc. Intermediates for production of 1,1-dioxopenicillanoyloxymethyl 6-(2-amino-2-phenylacetamido)penicillanates. 4,393,001, Cl. 260-239.100.
Jeannotte, Raymond V.: *See*—
Redmond, Harry W.; and Jeannotte, Raymond V., 4,392,658, Cl. 280-11.180.
Jenkins, William A., to Monarch Marking Systems, Inc. Composite label web. 4,393,107, Cl. 428-42.000.
Jennewein, Hans M.: *See*—
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mieras, Joachim, 4,393,069, Cl. 424-265.000.
Jens, Richard A., to General Electric Company. Outer rotation bearing for x-ray tube. 4,393,511, Cl. 378-128.000.
JEOL Ltd.: *See*—
Norioka, Setsuo, 4,393,309, Cl. 250-396.00R.
Jerard, Robert B., to Dartmouth College, Trustees of. Three-dimensional model-making system. 4,393,450, Cl. 364-474.000.
Jesse, Erich: *See*—
Neuhaus, Dieter; Sohner, Gerhard; Ruf, Walter; Jesse, Erich; and Roth, Helmut, 4,393,432, Cl. 361-104.000.
Jewell, John N.: *See*—
Newton, Richard P.; Harper, Patrick H.; Geiss, Vernon L.; and Jewell, John N., 4,392,501, Cl. 131-300.000.
Jikihara, Kazuo: *See*—
Iori, Shinichi; Kajiwara, Ikuo; and Jikihara, Kazuo, 4,392,883, Cl. 71-93.000.
Jimenez, James A., to Electra Food Machinery, Inc. Cooking apparatus. 4,392,418, Cl. 99-330.000.
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Co., Ltd. Controllable ink drop velocity type ink-jet printer. 4,393,385, Cl. 346-75.000.
JLG Industries Inc.: *See*—
Mellott, Lex A., 4,392,698, Cl. 339-10.000.
Johannsen, James R., to McQuay-Perfex Inc. Variable dead band pressure control system. 4,392,417, Cl. 98-1.500.
Johannson, Richard J., to Towmotor Corporation. Carriage assembly with shiftable forks. 4,392,773, Cl. 414-667.000.
Johenning, John B.: *See*—
Hall, Charles P.; and Johenning, John B., 4,392,872, Cl. 55-36.000.
Johne, Hans: *See*—
Forster, Karl-Heinz; and Johne, Hans, 4,392,429, Cl. 101-365.000.
Johnson, Avery A., Jr.: *See*—
Mason, Arthur D., Jr.; Johnson, Avery A., Jr.; Walker, Harrel L.; Bowler, Eleanor G.; and Ritchey, Charles R., 4,393,048, Cl. 424-132.000.
Johnson, Brian C.: *See*—
Kellogg, Richard A.; May, John B.; and Johnson, Brian C., 4,393,501, Cl. 371-33.000.
Johnson, Carl F.: *See*—
Bowles, David J.; Clancy, Douglas E.; Johnson, Carl F.; and Neal, Danny M., 4,392,758, Cl. 400-697.100.
Johnson, Fred L., Jr.; and Watts, Lewis W., Jr., to Texaco Inc. Process for the production of alkylene glycols. 4,393,254, Cl. 568-867.000.
Johnson, James C., to Duff-Norton Company. Shielding apparatus for linear actuator. 4,392,390, Cl. 74-89.150.
Johnson & Johnson Baby Products Company: *See*—
Butterworth, George A. M.; and Fillwalk, Frank J., 4,392,861, Cl. 604-366.000.
Johnson, Lewis H.: *See*—
Capezzuto, John P.; and Johnson, Lewis H., 4,392,425, Cl. 101-327.000.
Johnson, Matthey & Co., Limited: *See*—
Irons, Ian B., 4,392,292, Cl. 29-421.00R.
Johnstone, George A. Letterguide. 4,392,306, Cl. 33-174.00B.
Jones, Eric: *See*—
Hartshorn, Angus J.; and Jones, Eric, 4,392,983, Cl. 252-429.00B.
Jones, John F.: *See*—
Li, George S.; Jones, John F.; and Giffen, William M., Jr., 4,393,020, Cl. 264-108.000.
Jones, Robert T.; and Harrison, Martin B., to Goodall Rubber Company. Hose handling device. 4,392,676, Cl. 285-61.000.
Jones, Ronald R., to Circuit Research Labs. Voltage controlled resistor. 4,393,346, Cl. 323-280.000.
Jones, Stanley W.; and Franz, James H., Jr., to Westinghouse Electric Corp. Vehicle propulsion motor control apparatus. 4,393,338, Cl. 318-86.000.
Jones, William R., to Boeing Company, The. Direction finding and ranging system for locating scanning emitters. 4,393,382, Cl. 343-112.00D.
Joseph, Horst: *See*—
Galow, Manfred; and Joseph, Horst, 4,392,919, Cl. 202-228.000.
Joseph, Joseph P.: *See*—
Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, 4,393,055, Cl. 424-180.000.
Joy Manufacturing Company: *See*—
Novoselac, John; and Churcher, Dale L., 4,392,846, Cl. 494-40.000.
Jozepaitis, Charles M., to Nash Engineering Company, The. Liquid ring pump employing discharged pumping liquid for discharge port control. 4,392,783, Cl. 417-68.000.
Jung, Hubert: *See*—
Fechter, Leonhard; and Jung, Hubert, 4,392,952, Cl. 210-159.000.
Junker, Otto: *See*—
Hage, Manfred; Demuth, Hans; and Junker, Otto, 4,392,526, Cl. 165-154.000.

Juy, Henri, to Le Simplex. Guide sprocket wheel, more particularly for the gear shift devices of bicycles and the like. 4,392,841, Cl. 474-156.000.

Kabushiki Kaisha Fujikoshi: *See*—
Shikano, Michio; and Kitagawa, Shuzi, 4,392,799, Cl. 418-169.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,267, Cl. 15-88.000.
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,506, Cl. 134-46.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Sato, Yoshito; and Takahashi, Tomoyuki, 4,392,396, Cl. 74-785.000.

Kabushiki Kaisha Nippon Coinco: *See*—
Hayashi, Yukichi, 4,392,564, Cl. 194-1.00N.

Kabushiki Kaisha Sunpack: *See*—
Nishiyama, Masanobu; Kanazawa, Fusao; Tanaka, Hisaji; and Nishimura, Tatsuo, 4,392,269, Cl. 15-145.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Aoki, Kenji; Goto, Mitsuhiro; and Miura, Teiji, 4,393,390, Cl. 346-155.000.
Hosokawa, Minoru; Ikeda, Masayuki; and Yazawa, Satoru, 4,393,380, Cl. 340-805.000.
Ikeda, Masayuki, 4,393,405, Cl. 358-153.000.
Yoshino, Masahito, 4,392,748, Cl. 368-88.000.

Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Arakawa, Kaneyasu; and Mizuno, Shigeo, 4,393,360, Cl. 335-164.000.
Iwata, Masayosi; and Douke, Harumi, 4,393,280, Cl. 200-4.000.
Yamamoto, Toshimasa; Mori, Mamoru; and Kinaga, Eiichi, 4,392,672, Cl. 280-803.000.

Kabuto, Masami: *See*—
Okuda, Kuniteru; Fukami, Teruki; Asayama, Yoshiaki; Wada, Shunichi; and Kabuto, Masami, 4,392,385, Cl. 73-861.230.

Kaeding, Warren W., to Mobil Oil Corporation. Production of isopropylbenzene. 4,393,262, Cl. 585-467.000.

Kaesmacher, Jakob: *See*—
Schwarzenberg, Norbert; Ueberwolf, Heinz; and Kaesmacher, Jakob, 4,392,404, Cl. 83-886.000.

Kahkipuro, Matti, to Elevator GmbH. Procedure and means for monitoring current data in a thyristor-controlled direct current drive. 4,393,442, Cl. 363-70.000.

Kahl, George D.: *See*—
Schmidt, Edward M.; and Kahl, George D., 4,392,412, Cl. 89-14.00D.

Kai, Junjiro: *See*—
Kimura, Hiroshi; and Kai, Junjiro, 4,392,971, Cl. 252-70.000.

Kajiwara, Ikuo: *See*—
Iori, Shinichi; Kajiwara, Ikuo; and Jikihara, Kazuo, 4,392,883, Cl. 71-93.000.

Kajiwara, Kazuo: *See*—
Sasai, Mitsuo; Tomikawa, Kiyozi; and Kajiwara, Kazuo, 4,392,295, Cl. 29-509.000.

Kakimoto, Toshihiko, to Nissan Motor Co., Ltd. Vibration absorber for an automotive vehicle. 4,392,640, Cl. 267-141.200.

Kallay, Tamas: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.

Kalyanaraman, Palaiyur S.: *See*—
Gaudiana, Russell A.; and Kalyanaraman, Palaiyur S., 4,393,194, Cl. 528-348.000.

Kamatics Corporation: *See*—
Wirth, Charles J., 4,392,837, Cl. 464-69.000.

Kamegaya, Takeo; and Watanabe, Satoshi, to Okaya Electric Industries Co., Ltd. DC Plasma display panel. 4,393,326, Cl. 313-582.000.

Kamens, Ernest R., to Pennwalt Corporation. Reaction of t-alkylhydrazinium salts and ogranic peroxides to foam unsaturated polyester resins. 4,393,148, Cl. 521-93.000.

Kamohara, Eiji: *See*—
Takenaka, Shigeo; Kamohara, Eiji; and Seino, Kazuyuki, 4,392,914, Cl. 156-633.000.

Kanamaru, Hisanobu; Tohkairin, Akira; Tatsumi, Hideo; Asahi, Naotatsu; and Haginoya, Mitsuo, to Hitachi, Ltd. Method of joining two metal members. 4,392,296, Cl. 29-520.000.

Kanazawa, Fusao: *See*—
Nishiyama, Masanobu; Kanazawa, Fusao; Tanaka, Hisaji; and Nishimura, Tatsuo, 4,392,269, Cl. 15-145.000.

Kanda, Shoichi; and Kawamura, Gengiro, to Nitto Chemical Industry, Co., Ltd. Method for stabilizing an acrylamide polymer in a petroleum recovery process. 4,393,163, Cl. 524-608.000.

Kaneda, Hiroshi; Arai, Katsuhiko; Suzuki, Akira; and Ohashi, Takashi, to Bridgestone Tire Co., Ltd. Process of producing urethane-modified polyisocyanurate foams. 4,393,015, Cl. 264-51.000.

Kaneko, Shinji, to Sony Corporation. Velocity error compensator for time base error corrections of periodic information signals. 4,393,413, Cl. 358-326.000.

Kanno, Susumu: *See*—
Sugiura, Shigekata; and Kanno, Susumu, 4,393,436, Cl. 361-380.000.

Kanomata, Ichiro: *See*—
Sakudo, Noriyuki; Tokiquchi, Katsumi; Koike, Hidemi; Kanomata, Ichiro; and Nakashima, Humihiko, 4,393,333, Cl. 315-111.810.

Kanoto, Masanobu: *See*—
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Kanto Seiki Co., Ltd.: *See*—
Sugawara, Noboru, 4,392,836, Cl. 464-52.000.

Kantz, Dieter; and Seher, Eugen, to Siemens Aktiengesellschaft. Monolithically integrated semiconductor memory with dummy and charge equalization cells. 4,393,478, Cl. 365-210.000.

Kao Soap Co. Ltd.: *See*—
Omori, Toshiyuki; and Abe, Kunihiro, 4,392,951, Cl. 209-307.000.

Kaplan, George: *See*—
Gresser, Herbert D.; Kaplan, George; and Nussenbaum, Joseph, 4,392,476, Cl. 125-30.00R.

Kaps, Hermann, to Howaldtwerke - Deutsche Werft Aktiengesellschaft Hamburg und Kiel; and LGA Gastechnik GmbH. Offshore mooring system. 4,392,447, Cl. 114-230.000.

Karls, Michael A.: *See*—
Bloemers, James L.; Schiek, James M.; Frazzell, Michael E.; and Karls, Michael A., 4,392,779, Cl. 415-141.000.

Kasahara, Masatoshi: *See*—
Matsuda, Yasumasa; Mukumoto, Kyoji; Sagae, Syoji; and Kasahara, Masatoshi, 4,393,388, Cl. 346-140.00R.

Kasahara, Yasushi: *See*—
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Kasai, Masaji: *See*—
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Katada, Katsutoshi: *See*—
Okumura, Taketo; Tsukahara, Taiji; Mikuriya, Takashi; Watanabe, Hideki; and Katada, Katsutoshi, 4,392,371, Cl. 72-231.000.

Katho, Eiichi: *See*—
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, 4,393,210, Cl. 546-141.000.

Kato, Akira: *See*—
Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, 4,393,294, Cl. 219-121.0EC.

Kato, Mitsuyuki: *See*—
Hirashima, Tsuneaki; Miyata, Toshiyuki; Yamamoto, Yoshikazu; and Kato, Mitsuyuki, 4,393,216, Cl. 548-305.000.

Kato, Motohiko: *See*—
Watanabe, Masazumi; Uehara, Mikio; Shimazu, Yoshimi; Ishiyama, Jiro; and Kato, Motohiko, 4,393,083, Cl. 426-15.000.

Kato, Takashi; and Hayakawa, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Temperature-responsive control device for carburetor. 4,393,012, Cl. 261-39.00A.

Kato, Tetsuo; and Makita, Naoki, to Tokico Ltd. Vehicle suspension device. 4,392,638, Cl. 267-64.240.

Kato, Toshio: *See*—
Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, 4,393,000, Cl. 260-239.00E.

Kato, Yoshitaka: *See*—
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Katsuragawa, Kanzi: *See*—
Kubo, Masashige; Yoshimitsu, Mitsuaki; and Katsuragawa, Kanzi, 4,393,246, Cl. 568-639.000.

Kaufhold, Wolfgang: *See*—
Fork, Kurt; Kaufhold, Wolfgang; Meusel, Wolfgang; and Waldmann, Hermann, 4,393,345, Cl. 322-19.000.

Kaufmann, John C.; and Lenox, Ronald S., to Armstrong World Industries, Inc. Method of uniformly dyeing high temperature heat set polyester yarn. 4,392,863, Cl. 8-400.000.

Kaufmann, Karl-Ernst: *See*—
Durwald, Dierk; and Kaufmann, Karl-Ernst, 4,392,434, Cl. 104-70.000.

Kautz, Jon F.: *See*—
Billman, Timothy B.; and Kautz, Jon F., 4,392,300, Cl. 29-739.000.

Kaveloski, Robert J. Disposable fly trap. 4,392,322, Cl. 43-118.000.

Kawamoto, Akira: *See*—
Watai, Haruhisa; Furuta, Hiroyuki; and Kawamoto, Akira, 4,393,120, Cl. 428-457.000.

Kawamoto, Mutsumi: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, 4,393,467, Cl. 364-424.100.

Kawamura, Gengiro: *See*—
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Kawasaki Steel Corporation: *See*—
Kodaka, Mikio; Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, 4,392,886, Cl. 75-52.000.
Matsuzaki, Minoru; Kawauchi, Toshiei; Murakami, Tsugio; and Kishira, Hideo, 4,392,815, Cl. 431-175.000.
Okumura, Taketo; Tsukahara, Taiji; Mikuriya, Takashi; Watanabe, Hideki; and Katada, Katsutoshi, 4,392,371, Cl. 72-231.000.

Kawashima, Nobuyuki: *See*—
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Kawauchi, Toshiei: *See*—
Matsuzaki, Minoru; Kawauchi, Toshiei; Murakami, Tsugio; and Kishira, Hideo, 4,392,815, Cl. 431-175.000.

Kear, Bernard H.: *See*—
Pearson, David D.; Lemkey, Frank D.; and Kear, Bernard H., 4,392,894, Cl. 148-2.000.
Keith, Dennis D.; Tengi, John P.; and Weigele, Manfred, to Hoffmann-La Roche Inc. β-Lactamase inhibitors. 4,393,003, Cl. 260-245.20R.
Kellogg, Richard A.; May, John B.; and Johnson, Brian C., to General Electric Company. Line protocol for communication system. 4,393,501, Cl. 371-33.000.
Kemp, Merle L., Jr.: *See*—
Schreiner, Gary W.; Kemp, Merle L., Jr.; and Chernoff, Edward A., 4,393,359, Cl. 335-128.000.
Kenmartin Development, Inc.: *See*—
Grout, Kenneth M., 4,392,889, Cl. 75-97.00A.
Kerr, Douglas P.: *See*—
Ashlock, Robert L.; Gabrielson, Carl E.; Kerr, Douglas P.; Rasmussen, David J.; Stump, Theodore M.; and Thode, Charles W., 4,393,491, Cl. 370-13.000.
Kessick, Michael A., to Research Council of Alberta. Alkali recycle process for recovery of heavy oils and bitumens. 4,392,944, Cl. 208-188.000.
Kessler, Gerald. Extruded fin-type weatherstrip. 4,393,109, Cl. 428-119.000.
Keyes, Gary S.; Georges, Jean-Pierre J.; and DallaPiazza, Dennis G., to General Electric Company. Subtraction fluoroscopy method and apparatus. 4,393,402, Cl. 358-111.000.
Khukhry, Sergei A.: *See*—
Glebov, Vladimir P.; Krivtsov, Georgy V.; Danchenkov, Jury V.; Khukhry, Sergei A.; and Schepotin, Sergei G., 4,392,567, Cl. 198-544.000.
Kihara, Shiso: *See*—
Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, 4,393,294, Cl. 219-121.0EC.
Kihara, Yoshiro: *See*—
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Kikkoman Corporation: *See*—
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Kikuchi, Katsuaki: *See*—
Ida, Michiaki; Hagiwara, Noriaki; Yamago, Naoyoshi; Yoshioka, Masahiro; and Kikuchi, Katsuaki, 4,392,751, Cl. 384-99.000.
Kim, Hueng T.; and Nehmey, Sam D., to B. F. Goodrich Company, The. Apparatus and method for making foamed resin products. 4,393,017, Cl. 264-53.000.
Kimball Industries, Inc.: *See*—
Martin, Robert W., 4,392,381, Cl. 73-663.000.
Kimball International, Inc.: *See*—
Fritz, Gary R., 4,392,406, Cl. 84-1.260.
Kimoto, Tatsuzi: *See*—
Yoshinaka, Satoru; Fushida, Masao; and Kimoto, Tatsuzi, 4,393,143, Cl. 501-89.000.
Kimura, Hiroshi; and Kai, Junjiro, to Mitsubishi Denki Kabushiki Kaisha. Heat storage material. 4,392,971, Cl. 252-70.000.
Kimura, Kaoru; and Sugiura, Kyoji, to Toagosei Chemical Industry Co., Ltd. 2-Cyanoacrylate adhesive composition. 4,393,183, Cl. 526-245.000.
Kimura, Kenji, to Olympus Optical Co., Ltd. Automatic focus control system for video camera with improved position detecting apparatus. 4,392,726, Cl. 354-25.000.
Kimura, Kenji, to Olympus Optical Co., Ltd. Motor apparatus. 4,393,339, Cl. 318-254.000.
Kimura, Kenji, to Olympus Optical Co., Ltd. Focusing apparatus for image pickup device. 4,393,409, Cl. 358-227.000.
Kimura, Kenji, to Olympus Optical Company Limited. Time base error correction system. 4,393,418, Cl. 360-22.000.
Kinaga, Eiichi: *See*—
Yamamoto, Toshimasa; Mori, Mamoru; and Kinaga, Eiichi, 4,392,672, Cl. 280-803.000.
Kinoshita, Yoshio: *See*—
Ohta, Teruto; and Kinoshita, Yoshio, 4,392,926, Cl. 204-67.000.
Kinsey, Brian D.; and Smock, Steven W., to Emhart Industries, Inc. Method and means controlling defrost cycles of a cooling unit. 4,392,357, Cl. 62-153.000.
Kirchmayr, Rudolf: *See*—
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Kirner, Kuno: *See*—
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Kishira, Hideo: *See*—
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Kiss, Pal: *See*—
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Kita, Toshio, to Fujikin International, Inc. Electromagnetic valve. 4,392,634, Cl. 251-129.000.
Kitagawa, Norihisa; and Iwamoto, Eisaburo, to Texas Instruments Incorporated. Non-volatile semiconductor memory and the testing method for the same. 4,393,475, Cl. 365-201.000.
Kitagawa, Shuzi: *See*—
Shikano, Michio; and Kitagawa, Shuzi, 4,392,799, Cl. 418-169.000.
Kitamura, Takashi, to Canon Kabushiki Kaisha. Beam recording apparatus effecting the recording by a plurality of beams. 4,393,387, Cl. 346-108.000.
Kitamura, Yoichi; and Hotta, Hisashi, to Toyo Seikan Kaisha Limited. Retortable bonded can. 4,392,582, Cl. 220-75.000.
Kitamura, Yukio: *See*—
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Kitchen, James A.: *See*—
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Kiwi Coders Corporation: *See*—
Siegal, Burton L., 4,392,430, Cl. 101-381.000.
Kizara, Masao: *See*—
Okuma, Kiwamu; Haga, Tsunehiro; Kizara, Masao; Otaki, Keiji; and Hirai, Ayahiro, 4,392,878, Cl. 65-6.000.
Klein, Hermann: *See*—
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Klein, Lutz: *See*—
Dobrusskin, Alexander; Klein, Lutz; and Woizan, Gunter, 4,393,331, Cl. 313-489.000.
Klein, Theodore H., to Bell Telephone Laboratories, Incorporated. Fabrication of conductor-clad composites using molding compounds and techniques. 4,393,111, Cl. 428-195.000.
Klockner-Humboldt-Deutz AG: *See*—
Brachthauser, Kunibert; and Herchenbach, Horst, 4,392,822, Cl. 432-106.000.
Klosa, Joseph. Production of nonhygroscopic salts of 4-hydroxybutyric acid. 4,393,236, Cl. 562-579.000.
Kluver, Horst: *See*—
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Kmita, Anatoly M.: *See*—
Bagdasarian, Alexandr S.; Gulyaev, Jury V.; Fedorets, Vladimir N.; and Kmita, Anatoly M., 4,393,321, Cl. 310-313.00B.
Knapp, George W.; and Spaulding, Bernard B., to NCR Corporation. Chip topography for integrated circuit communication controller. 4,393,464, Cl. 364-900.000.
Knapp, Maynard K.: *See*—
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Knauf, Walter: *See*—
Ramdohr, Detlef; Knauf, Walter; Brensing, Karl-Heinz; and Kummerling, Rolf, 4,392,369, Cl. 72-96.000.
Kneer, Franz, to Gebruder Weiss KG. Process for composting decaying material of organic waste and/or sewage sludge in two processing steps. 4,392,881, Cl. 71-9.000.
Knetsch, Manfred; and Romann, Peter, to Robert Bosch GmbH. Flow rate meter. 4,392,386, Cl. 73-861.760.
Knight, Lindsay C.; and Cottis, Robert A., to Australasian Training Aids Pty. Ltd. Target comprising a resilient material coated with thermoluminescent material. 4,392,652, Cl. 273-358.000.
Knight, Richard W., Jr.: *See*—
Dobson, Jesse C.; and Knight, Richard W., Jr., 4,392,988, Cl. 252-455.00R.
Knowles, Barbara B.; and Aden, David P., to Wistar Institute of Anatomy and Biology, The. Human hepatoma derived cell line, process for preparation thereof, and uses therefor. 4,393,133, Cl. 435-6.000.
Kobashi, Mamoru; and Itoh, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the idling speed of an engine. 4,392,468, Cl. 123-339.000.
Kobayashi, Masaaki; Takeuchi, Akihiro; and Fujisawa, Kiyoji, to Matsushita Electric Industrial Co., Ltd. Tracking system. 4,393,417, Cl. 360-10.300.
Kobayashi, Masaaki: *See*—
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Kobayashi, Masaharu: *See*—
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Kobayashi, Yoshinari: *See*—
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Koch, Gary: *See*—
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Kodaka, Mikio; Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, to Kawasaki Steel Corporation. Method of recovering CO-rich exhaust gas in refining of metal. 4,392,886, Cl. 75-52.000.
Kodama, Yutaka: *See*—
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,393,385, Cl. 346-75.000.
Koenig & Bauer AG: *See*—
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Wieland, Erich G., 4,392,428, Cl. 101-365.000.
Wieland, Erich G., 4,392,431, Cl. 101-426.000.
Koenig, Herbert G., Jr.: *See*—
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; Stacy, Robert A.; and Meyer, Danny D., 4,393,393, Cl. 357-81.000.
Koenig, Robert H. Solar collector means. 4,392,483, Cl. 126-450.000.

Kohler, Norbert: *See—*
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Kohsaka, Hiroji: *See—*
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Koike, Hidemi: *See—*
Sakudo, Noriyuki; Tokiquchi, Katsumi; Koike, Hidemi; Kanomata, Ichiro; and Nakashima, Humihiko, 4,393,333, Cl. 315-111.810.

Koine, Richard, to Rheinmetall GmbH. Ammunition belt. 4,392,414, Cl. 89-35.00R.

Kojima, Chiaki; Hasegawa, Kayoko; and Miyahara, Kosuke, to Sony Corporation. Method for manufacturing in-line hologram lens. 4,393,126, Cl. 430-2.000.

Kollar, John, to Redox Technologies, Inc. Process for producing ethylene glycol. 4,393,252, Cl. 568-852.000.

Komatsu, Yasuhiro: *See—*
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Komatsu, Yukihiko: *See—*
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Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,506, Cl. 134-46.000.

Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See—*
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Komiya, Shigeo: *See—*
Tarumi, Niro; Komiya, Shigeo; and Sugimura, Mitsuo, 4,393,184, Cl. 526-261.000.

Kondo, Nobuo; Naganoma, Masanori; Hibi, Hitoshi; Fujii, Tetsuo; and Suzuki, Kunihiko, to Nippondenso Co., Ltd. Method and system for forecasting and warning on automotive abnormalities. 4,393,365, Cl. 340-57.000.

Konheim, Alan G.; Matyas, Stephen M.; and Meyer, Carl H., to International Business Machines Corporation. Method and apparatus incorporating a one-way sequence for transaction and identity verification. 4,393,269, Cl. 178-22.080.

Konishi, Keizo, to Tokai Rubber Industries Ltd. Damper support for engine mounts. 4,392,639, Cl. 267-140.100.

Konrad, Rolf: *See—*
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Korbonits, Dezso: *See—*
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Kotani, Sumihisa: *See—*
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Koulbanis, Constantin; Zabotto, Arlette; Griat, Jacqueline; and Charrier, Jean, to Societe Anonyme dite L'Oreal. Solutions containing at least one essential fatty acid and vegetable oil, and cosmetic compositions containing these solutions. 4,393,043, Cl. 424-59.000.

Kousens, William L. Drawer stop. 4,392,697, Cl. 312-348.000.

Koyama, Hiroyasu: *See—*
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Koyama, Yoshiyuki: *See—*
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Krahn, Friedrich: *See—*
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Kratochvil, Jiri: *See—*
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Kraus, Georg: *See—*
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Kraus, Hans-Joachim: *See—*
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Kraus, Joseph S.: *See—*
Feldman, Leonard C.; Kraus, Joseph S.; Tolk, Norman H.; Traum, Morton M.; and Tully, John C., 4,393,311, Cl. 250-459.100.

Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, to A. T. Ramot Plastics, Ltd. Process for the removal of urea from aqueous solutions. 4,392,960, Cl. 210-651.000.

Krauthausen, Edmund: *See—*
Uhrhan, Paul; and Krauthausen, Edmund, 4,393,206, Cl. 544-51.000.

Kreeley, Bruce K., to Singer Company, The. Relief valve. 4,392,512, Cl. 137-496.000.

Kreisman, Wallace S., to Spire Corporation. Method of fabricating a thermal pane window and product. 4,393,105, Cl. 428-34.000.

Kresner, Stanley. Adhesive bandage material. 4,393,150, Cl. 523-111.000.

Kriechbaum, Karl: *See—*
Mittelbach, Gunter; Horstmann, Gunter; Heiss, Werner; Hoffmann, Dietrich; Siebrecht, Gunter; Kriechbaum, Karl; and Rapp, Gunter, 4,393,290, Cl. 200-148.00A.

Krishnakumar, Suppayan M.: *See—*
Pushee, Joan C.; Harry, Ieuan L.; Beck, Martin H.; and Krishnakumar, Suppayan M., 4,392,804, Cl. 425-174.80E.

Krivtsov, Georgy V.: *See—*
Glebov, Vladimir P.; Krivtsov, Georgy V.; Danchenkov, Jury V.; Khukhry, Sergei A.; and Schepotin, Sergei G., 4,392,567, Cl. 198-544.000.

Kroeger, James K.: *See—*
Berting, John P.; and Kroeger, James K., 4,393,379, Cl. 340-784.000.

Krupa, Andrew S.: *See—*
Velenyi, Louis J.; Dolhyj, Serge R.; and Krupa, Andrew S., 4,393,260, Cl. 585-357.000.

Kruyer, Jan. Conditioning drum for slurries and emulsions. 4,392,949, Cl. 209-5.000.

Krzeptowski, Andrzej J., to GTE Automatic Electric Incorporated. Apparatus separating hybrid substrate. 4,392,290, Cl. 29-239.000.

KSD Industries, Inc.: *See—*
Finkel, Abram R., 4,392,272, Cl. 16-95.00R.

Kubik, Klaus: *See—*
Anstotz, Helmut; Kubik, Klaus; and Paulussen, Heinz, 4,392,288, Cl. 29-116.0AD.

Kubis, Charles S.; and Walter, John, to Continental Can Company, Inc. Necked-in container body and apparatus for and method of forming same. 4,392,764, Cl. 413-69.000.

Kubo, Masashige; Yoshimitsu, Mitsuaki; and Katsuragawa, Kanzi, to Toyo Soda Manufacturing Co., Ltd. Process for brominating side chain of m-phenoxytoluene. 4,393,246, Cl. 568-639.000.

Kubota, Reiko: *See—*
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,393,209, Cl. 544-404.000.

Kuehn, Andrew, III; and Hoefs, Edwin G., to Comact Pump Corporation. Liquid level controller. 4,392,782, Cl. 417-36.000.

Kuenemund, Friedrich L., to Siemens Aktiengesellschaft. Filter circuit for electric waves. 4,393,356, Cl. 333-165.000.

Kueny, Michel: *See—*
Gauvain, Roger; and Kueny, Michel, 4,392,276, Cl. 19-97.000.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. One pot diazotization, coupling and quaternization of aminotriazoles. 4,392,998, Cl. 260-146.00R.

Kumada, Akio; Ihochi, Takahiko; Homma, Makoto; and Tanaka, Masashi, to Hitachi, Ltd. Display device structure. 4,392,747, Cl. 368-88.000.

Kume, Toyohiko: *See—*
Saito, Junichi; and Kume, Toyohiko, 4,392,929, Cl. 204-158.0HA.

Kumiai Chemical Industry Co. Ltd.: *See—*
Iori, Shinichi; Kajiwara, Ikuo; and Jikihara, Kazuo, 4,392,883, Cl. 71-93.000.

Kummerling, Rolf: *See—*
Ramdohr, Detlef; Knauf, Walter; Brensing, Karl-Heinz; and Kummerling, Rolf, 4,392,369, Cl. 72-96.000.

Kunze, Dieter, to U.S. Philips Corporation. Circuit arrangement for the generation of a sawtooth voltage. 4,393,314, Cl. 307-228.000.

Kuramoto, Takashi: *See—*
Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,393,200, Cl. 536-18.100.

Kurgansky, Pavel M.: *See—*
Buryakov, Viktor P.; Ivanov, Gennady M.; Kislik, Mikhail I.; Kurgansky, Pavel M.; Shmotkin, Mark B.; and Eikhenvald, Eduard V., 4,392,551, Cl. 184-7.00D.

Kurita, Kenji: *See—*
Inuzuka, Tsuneki; Murakami, Koichi; Kurita, Kenji; and Sakamaki, Hisashi, 4,392,741, Cl. 355-14.00R.

Kushima, Mamoru: *See—*
Sasagawa, Masaru; Umeda, Tatsuo; and Kushima, Mamoru, 4,392,400, Cl. 83-185.000.

Kusters, Eduard: *See—*
Anstotz, Helmut; Kubik, Klaus; and Paulussen, Heinz, 4,392,288, Cl. 29-116.0AD.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Kasai, Masaji; Hirayama, Noriaki; Morimoto, Makoto; and Fukui, Masanori, 4,393,056, Cl. 424-181.000.

Kyser, Edmond L., to System Industries Inc. Ink printhead droplet ejecting technique. 4,393,384, Cl. 346-1.100.

L.B. (Plastics) Limited: *See—*
Litchfield, Leon G.; and Hardy, Terence, 4,392,696, Cl. 312-330.00R.

La Telemecanique Electrique: *See—*
Hardouin, Pierre, 4,392,677, Cl. 285-137.00R.

Laakmann, Katherine D.: *See—*
Laakmann, Peter; and Laakmann, Katherine D., 4,393,506, Cl. 372-59.000.

Laakmann, Peter; and Laakmann, Katherine D., to Walwel, Inc. Sealed-off RF excited CO_2 lasers and method of manufacturing such lasers. 4,393,506, Cl. 372-59.000.

LaBaw, Glenn D.: *See*—
Pomper, Seymour; and LaBaw, Glenn D., 4,393,084, Cl. 426-19.000.
Labofina, S.A.: *See*—
Bracke, William J. I.; and Lanza, Emmanuel, 4,393,171, Cl. 525-309.000.
Debande, Guy F. S., 4,392,948, Cl. 208-254.00R.
LaFever, Clifford E.; and Peck, John H., to United States of America, Army. Machine gun ammunition loading system. 4,392,407, Cl. 89-33.0BB.
La Force, Jean, to Stringer, Carl; Stringer Oil & Gas Co.; La Force, Jean; and Stringer, Carl Thomas, a part interest to each. Preparation of pipe ends for solid phase welding. 4,392,603, Cl. 228-196.000.
Lagus, Peter L.; Peterson, Edward W.; and Hicks, William O., to S-Cubed. Method and apparatus for monitoring borehole conditions. 4,392,376, Cl. 73-155.000.
Laine, Norman R.; and Herrera, Jose E., to W. R. Grace & Co. Alumina spheroids with controlled small particle size and a process for producing them. 4,392,987, Cl. 252-448.000.
L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes: *See*—
Tourdot, Jacques; and Carron, Henry, 4,392,975, Cl. 252-99.000.
Lambrech, Matthew A., to Energy Research Corporation. Fuel cell temperature control assembly. 4,393,123, Cl. 429-24.000.
Lammers, Gerard C.: *See*—
Allen, John K.; and Lammers, Gerard C., 4,393,264, Cl. 585-469.000.
Landa, Benzion, to Savin Corporation. Liquid developer copier cleaning system incorporating resilient closed-cell cleaning roller. 4,392,742, Cl. 355-15.000.
Lang, Linton W.; and Stetson, Robert L., to Pacific Nuclear Fuels, Inc. Reactor for production of U-233. 4,393,510, Cl. 376-172.000.
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mierau, Joachim, to C. H. Boehringer Sohn. 8-Arylalkyl-3-phenyl-3-nortropanols and salts thereof. 4,393,069, Cl. 424-265.000.
Langenstein, Max. Supply apparatus to provide electricity to motor-driven appliances, especially lawn edge trimmers, driven with electric motors. 4,392,661, Cl. 280-12.00M.
Lanko, Inc.: *See*—
Grosse, Aristid V.; and Cherry, Norman H., 4,392,865, Cl. 44-51.000.
Lanter, Kent J.: *See*—
Sullins, Richard D.; and Lanter, Kent J., 4,393,087, Cl. 426-74.000.
Lanza, Emmanuel: *See*—
Bracke, William J. I.; and Lanza, Emmanuel, 4,393,171, Cl. 525-309.000.
Laskoski, Leonard S.: *See*—
Volpe, Gerald T.; Laskoski, Leonard S.; Amodeo, Ralph J.; Swanson, William J.; and Gottesman, Jerome D., 4,393,352, Cl. 329-50.000.
Lauf, Robert J.; and Morgan, Chester S., to United States of America, Energy. Solid electrolytes strengthened by metal dispersions. 4,393,124, Cl. 429-104.000.
Laurel Bank Machine Co., Ltd.: *See*—
Sentoku, Hideshi, 4,392,504, Cl. 133-1.00A.
LaVia, Anthony L.: *See*—
Pawelchak, John M.; Chen, James L.; Cryan, John G.; and LaVia, Anthony L., 4,393,080, Cl. 428-355.000.
Lawrence, Randall K.: *See*—
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Lazare Kaplan & Sons, Inc.: *See*—
Gresser, Herbert D.; Kaplan, George; and Nussenbaum, Joseph, 4,392,476, Cl. 125-30.00R.
Le Simplex: *See*—
Juy, Henri, 4,392,841, Cl. 474-156.000.
LeBaron, Steven M., to Bush Universal, Inc. Molded shanks. 4,392,266, Cl. 12-146.00S.
le Bars, Jean F.: *See*—
Beck, Jean L.; le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, 4,393,408, Cl. 358-205.000.
Ledniczky, Laszlo: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.
Lee, Hyun C., to Gold Star Company, Ltd. Serial printing apparatus. 4,392,756, Cl. 400-144.200.
Lee, John D.: *See*—
Anderson, James E.; Lee, John D.; and Livermore, Frederick C., 4,393,433, Cl. 361-119.000.
Lee, John M.; and Bauman, William C., to Dow Chemical Co., The. Magnesium aluminate anion exchangers. 4,392,961, Cl. 210-679.000.
Lee, John M.; and Bauman, William C., to Dow Chemical Co. Magnesium aluminate anion exchangers. 4,392,979, Cl. 252-184.000.
Lee, John M.; and Bauman, William C., to Dow Chemical Co., The. Transition metal aluminates. 4,392,980, Cl. 252-184.000.
Lefferts, Johannes, to Steg Siebtechnik GmbH. Method for producing a sieve belt of thermosettable synthetic resin helices for a papermaking machine. 4,392,902, Cl. 156-161.000.
Legras, Roger M. H.; Biebuyck, Jean-Jacques E. R. G.; and Mercier, Jean P., to Imperial Chemical Industries PLC. Fast crystallizing polyester compositions. 4,393,178, Cl. 525-437.000.
Lehmann, Klaus, to Robert Bosch GmbH. Circuit for modifying the gradation of pictures produced by video signals. 4,393,406, Cl. 358-160.000.
Lehnert, Stanley E., to Zenith Radio Corporation. Article of manufacture for projection television system. 4,393,329, Cl. 313-477.00R.
Lehr, Klaus; Heymer, Gero; May, Christian; and Klein, Hermann, to Hoechst Aktiengesellschaft. Process for separating metals from aqueous solutions. 4,392,962, Cl. 210-688.000.
Leifeld, Ferdinand; Marx, Hans-Jurgen; and Scheuermann, Rolf, to Trutzschler GmbH & Co. KG. Apparatus for supporting fiber bales. 4,392,275, Cl. 19-81.000.
Leithauser, Horst: *See*—
Rigler, Josef K.; Wiesbofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,393,146, Cl. 521-56.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Little, William A., 4,392,362, Cl. 62-514.00R.
Lemkey, Frank D.: *See*—
Pearson, David D.; Lemkey, Frank D.; and Kear, Bernard H., 4,392,894, Cl. 148-2.000.
Lenox, Ronald S.: *See*—
Hoyle, Charles E.; and Lenox, Ronald S., 4,393,006, Cl. 260-349.000.
Kaufmann, John C.; and Lenox, Ronald S., 4,392,863, Cl. 8-400.000.
Leonard, John J.: *See*—
Sun, Hsiang-ning; Leonard, John J.; and Shalit, Harold, 4,393,038, Cl. 423-584.000.
Leonhart, Franz X. Combined lawn chair and table recliner. 4,392,685, Cl. 297-119.000.
LePage, Joseph R., to Timex Corporation. Watchband endpiece with capturing bead. 4,392,284, Cl. 24-265.00B.
Lesher, Kenneth W., to Stanadyne, Inc. Inverted bucket tappet with seal. 4,392,462, Cl. 123-90.550.
Leveque, Jean-Luc M.; and Gras, Gilbert J., to L'Oreal. Apparatus intended for classifying the quantity of a fatty product found on the skin surface. 4,392,498, Cl. 128-665.000.
Lever Brothers Company: *See*—
Cox, Roger B.; and Steer, David C., 4,393,089, Cl. 426-573.000.
Dehnel, Roger B., 4,392,908, Cl. 427-194.000.
Lewis, John, to Tektronix, Inc. Memory mapping system. 4,393,443, Cl. 364-200.000.
Leyse, Robert H. Method of and apparatus for measuring the power distribution in nuclear reactor cores. 4,393,025, Cl. 376-247.000.
LGA Gastechnik GmbH: *See*—
Kaps, Hermann, 4,392,447, Cl. 114-230.000.
Li, George S.; Jones, John F.; and Giffen, William M., Jr., to Standard Oil Company, The. Method for manufacturing a fiber-reinforced thermoplastic molded article. 4,393,020, Cl. 264-108.000.
Licentia Patent-Verwaltungs-GmbH: *See*—
Minner, Willy, 4,392,474, Cl. 123-644.000.
Mittelbach, Gunter; Horstmann, Gunter; Heiss, Werner; Hoffmann, Dietrich; Siebrecht, Gunter; Kriechbaum, Karl; and Rapp, Gunter, 4,393,290, Cl. 200-148.00A.
Lichtenstein, Joseph, to Whitman Medical Corporation. Vascular puncture stabilizer fitting for facilitating withdrawal. 4,392,856, Cl. 604-177.000.
Liebermann, Leonard N., to Tif Instruments, Inc. Transducer coupling apparatus for inhomogeneity detector. 4,392,374, Cl. 73-19.000.
Lilja, Launo L.; and Makitalo, Valto J., to Outokumpu Oy. Method and apparatus for forming a directioned suspension spray of a pulverous material and a reaction gas. 4,392,885, Cl. 75-26.000.
Lillie, Terrance L.: *See*—
Couper, Robert A.; Frediani, John K.; and Lillie, Terrance L., 4,393,377, Cl. 340-731.000.
Lindner, Christian; Ott, Karl-Heinz; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. High-notched-impact core-shell polymers having improved weather resistance. 4,393,172, Cl. 525-310.000.
Lindorfer, Walter: *See*—
Wagner, Fritz; Lindorfer, Walter; Jahn-Held, Wilhelm; and Schulz, Walther, 4,392,892, Cl. 134-25.100.
Lindtveit, Herbert E., to Sid Harvey, Inc. Valve controlled reversible pump with anticavitation means. 4,392,796, Cl. 418-32.000.
Linecker, Josef. Shoe for use with a cross-country ski. 4,392,313, Cl. 36-117.000.
Linnenbrink, Thomas E.; and Gradl, David A., to Q-Dot, Inc. High speed transient recorder systems. 4,393,357, Cl. 333-165.000.
Lipowski, Stanley A.; and Miskel, John J., Jr., to Diamond Shamrock Corporation. Amphoteric water-in-oil self-inverting polymer emulsion. 4,392,917, Cl. 162-168.100.
Lischke, Burkhard: *See*—
Anger, Klaus; Frosien, Juergen; Lischke, Burkhard; Plies, Erich; and Tonar, Klaus, 4,393,308, Cl. 250-396.00R.
Litchfield, Leon G.; and Hardy, Terence, to L.B. (Plastics) Limited. Drawers. 4,392,696, Cl. 312-330.00R.
Little, Roger G., to Spire Corporation. Process of making thin film high efficiency solar cells. 4,392,297, Cl. 29-572.000.
Little, William A., to Leland Stanford Junior University, The Board of Trustees of the. Micro miniature refrigerators. 4,392,362, Cl. 62-514.00R.
Livermore, Frederick C.: *See*—
Anderson, James E.; Lee, John D.; and Livermore, Frederick C., 4,393,433, Cl. 361-119.000.
Locher & Cie. AG: *See*—
Bertschinger, Hans; and Scherler, Alfred, 4,392,954, Cl. 210-195.300.
Loew, Peter: *See*—
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Lohr & Broenkamp GmbH: *See*—
Aucktor, Erich, 4,392,839, Cl. 464-183.000.
Welschof, Hans-Heinrich; and Damian, Karl, 4,392,838, Cl. 464-175.000.

Lohri, Bruno, to Hoffmann-La Roche Inc. Carotenoid intermediate by an oxidation process. 4,393,243, Cl. 568-344.000.

Lohstroh, Jan: *See*—
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Lomnes, Randy K.: *See*—
Burbank, Max B.; Lomnes, Randy K.; Vrba, Jiri; and Fife, Alistair A., 4,393,349, Cl. 324-248.000.

Looper, Norman G., to Action Instruments Co. Inc. Common mode voltage rejection circuit. 4,393,347, Cl. 324-126.000.

Lopapa, Alberto F.; and Hall, Theodore D., to Lopapa Institute, Inc. In-vitro diagnostic method for detection of acetylsalicylic acid ingestion. 4,393,040, Cl. 424-1.000.

Lopapa Institute, Inc.: *See*—
Lopapa, Alberto F.; and Hall, Theodore D., 4,393,040, Cl. 424-1.000.

Lord Corporation: *See*—
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L'Oreal: *See*—
Leveque, Jean-Luc M.; and Gras, Gilbert J., 4,392,498, Cl. 128-665.000.
Yquel, Jean-Pierre, 4,392,384, Cl. 73-830.000.

Loreck, Heinz, to ITT Industries, Inc. Method and a circuit for controlling the pressure in wheel brake cylinders of fluid-operated vehicular brakes. 4,393,447, Cl. 364-426.000.

Lorenz, Kurt: *See*—
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Louden, William G. Erasable dense paper and improved method of manufacturing. 4,393,103, Cl. 427-391.000.

Lowe, Derek: *See*—
Schopper, Bernd; Lowe, Derek; Reinartz, Hans-Dieter; and Tandler, Peter, 4,392,691, Cl. 303-6.00C.

Lowe, Derek W.: *See*—
Moody, Brian R.; Lowe, Duncan B.; and Lowe, Derek W., 4,392,435, Cl. 104-284.000.

Lowe, Duncan B.: *See*—
Moody, Brian R.; Lowe, Duncan B.; and Lowe, Derek W., 4,392,435, Cl. 104-284.000.

Lowery, Sterling W. Heavy duty mobile loading structure and system. 4,392,769, Cl. 414-397.000.

Lucas, Donald S.; Stone, Roger L.; and Cooper, Eugene R., to Procter & Gamble Company, The. Catheterization. 4,392,848, Cl. 604-53.000.

Lucas Industries Limited: *See*—
Heibel, Helmut, 4,392,558, Cl. 188-72.700.
Mowbray, Dorian F.; and Jarrett, Boaz A., 4,392,466, Cl. 123-299.000.
Mowbray, Dorian F., 4,392,793, Cl. 417-462.000.
Weston, Paul, 4,392,502, Cl. 123-342.000.

Ludlow Corporation: *See*—
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Ludman, Jacques E.: *See*—
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Luigi Franchi S.p.A.: *See*—
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Lumbers, Warwick J.: *See*—
Perisic, Milan; Lumbers, Warwick J.; and Bone, John A., 4,392,392, Cl. 74-626.000.

Lundborg, Olle G., to AB Bofors Elektronik. Weighbridge and method of producing it. 4,392,537, Cl. 177-134.000.

Luscher, Paul E., to Varian Associates, Inc. Molecular beam converters for vacuum coating systems. 4,392,453, Cl. 118-726.000.

Lutzenberger, Kurt: *See*—
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Lybrand, William, to Bengal, Inc. Anti-static material and method of making the material. 4,393,159, Cl. 524-243.000.

Lybrand, William, to Bengal, Inc. Anti-static material and method of making the material. 4,393,176, Cl. 525-379.000.

Lynch, Conrad L.: *See*—
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Madden, William M., to United Technologies Corporation. Viol exhaust nozzle with veer flap extension. 4,392,615, Cl. 239-265.370.

Maekawa, Hideyuki; Hiramoto, Shinji; Itaya, Kozo; Sato, Kokichi; and Nishida, Hirotaka, to Shionogi & Co., Ltd.; and Taisei Kako Co., Ltd. Glass vial with diagonal cut line. 4,392,577, Cl. 215-32.000.

Maerz Ofenbau AG: *See*—
Fussl, Erwin; and Berger, Norbert, 4,392,821, Cl. 432-96.000.

Magee Enterprises Ltd.: *See*—
Magee, S. Jim, 4,392,270, Cl. 15-322.000.

Magee, S. Jim, to Magee Enterprises Ltd. Surface cleaning apparatus. 4,392,270, Cl. 15-322.000.

Mahandru, Madan M.: *See*—
Bhaduri, Sumit; and Mahandru, Madan M., 4,393,244, Cl. 568-360.000.

Majer, Carlo D., to Rhea Vendors S.r.l. Coffee powder metering device for coffee vending machines. 4,392,593, Cl. 222-305.000.

Makabe, Osamu; Murai, Yasushi; Okonogi, Tuneo; Onodera, Masahiro; Koyama, Yoshiyuki; and Yoshida, Takashi, to Meiji Seika Kaisha, Ltd. Cephalosporin compounds. 4,393,058, Cl. 424-246.000.

Maki, Naoki; Numata, Seiji; Yamaguchi, Kiyoshi; and Yamamoto, Heroe, to Hitachi, Ltd. Superconductive coil system with protecting device. 4,393,429, Cl. 361-19.000.

Maki, Yoshitaka: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Maki, Yoshitaka, 4,393,075, Cl. 424-304.000.

Makita, Naoki: *See*—
Kato, Tetsuo; and Makita, Naoki, 4,392,638, Cl. 267-64.240.
Yamaguchi, Kiyoshi; and Makita, Naoki, 4,392,293, Cl. 29-436.000.

Makitalo, Valto J.: *See*—
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Mallet, Inger V.: *See*—
Henderson, Esther G.; and Mallet, Inger V., 4,393,045, Cl. 424-95.000.

Maloney, Robert T.; and Vogt, Carl L., to Coin Acceptors, Inc. Coin payout assembly. 4,392,505, Cl. 133-4.00A.

Mandrell, Richard J.: *See*—
Baker, Thomas B.; and Mandrell, Richard J., 4,392,575, Cl. 213-76.000.

Mandroian, Harold. Pressure pumping and priming pump apparatus. 4,392,791, Cl. 417-379.000.

Manello, Jeannette S.: *See*—
Rogers, Howard G.; Gaudiana, Russell A.; Manello, Jeannette S.; and Sahatjian, Ronald A., 4,393,196, Cl. 528-363.000.

Mania, Dieter: *See*—
Merkel, Wulf; Bormann, Dieter; Mania, Dieter; and Muschaweck, Roman, 4,393,072, Cl. 424-275.000.

Manis, Jack J.; and Highlander, Sarah K., to Upjohn Company, The. Cloning plasmid for streptomyces. 4,393,137, Cl. 435-172.000.

Maniv, Shmuel; and Westwood, William D., to Northern Telecom Limited. Reactive deposition method and apparatus. 4,392,931, Cl. 204-192.00R.

Mannesmann Aktiengesellschaft: *See*—
Ramdohr, Detlef; Knauf, Walter; Brensing, Karl-Heinz; and Kummerling, Rolf, 4,392,369, Cl. 72-96.000.

Mannesmann Demag AG: *See*—
Durwald, Dierk; and Kaufmann, Karl-Ernst, 4,392,434, Cl. 104-70.000.

Manser, Gerald E., to S R I International. Cationic polymerization. 4,393,199, Cl. 528-408.000.

Mao, Mark H. K.; Miller, Larry E.; and Weeman, John M., to Procter & Gamble Company, The. Process of preparing alkylpolysaccharides. 4,393,203, Cl. 536-124.000.

Marconi Company Limited, The: *See*—
de Neumann, Frederick B., 4,393,515, Cl. 455-606.000.

Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, to Texaco Inc. High turndown partial oxidation process. 4,392,869, Cl. 48-197.00R.

Marks, David T., to Mechanical Technology Incorporation. Stirling engine power control and motion conversion mechanism. 4,392,350, Cl. 60-518.000.

Marsan, Mario S.; and Hartwell, Edward W., to Procter & Gamble Company, The. Absorptive device. 4,392,862, Cl. 604-366.000.

Marshall, Harry L.; and Schwartz, Alan R., to GTE Products Corporation. Method of preparing a dark body phosphor. 4,393,118, Cl. 428-403.000.

Marshall, Thomas G., Jr., to Bell Telephone Laboratories, Incorporated. Digital filter bank. 4,393,456, Cl. 364-724.000.

Marsico, Joseph W., Jr.: *See*—
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,393,004, Cl. 260-245.500.

Martin, Howard. Self-contained root canal heated condenser dental instrument. 4,392,827, Cl. 433-32.000.

Martin, Jesse J. Combustion and electric engine. 4,392,457, Cl. 123-1.00R.

Martin, John K., III: *See*—
Whitney, Douglass G.; and Martin, John K., III, 4,392,847, Cl. 604-118.000.

Martin, Robert P., Jr. Cab for lift truck with swing out windshield. 4,392,669, Cl. 280-775.000.

Martin, Robert W., to Kimball Industries, Inc. Driver bar assembly. 4,392,381, Cl. 73-663.000.

Martindale, Troy E., Jr., to B. F. Goodrich Company, The. Portable pallet apparatus. 4,392,403, Cl. 83-418.000.

Maruhashi, Yoshitsugu; Tanikawa, Isao; Hirata, Sadao; Yazaki, Jinichi; and Sakano, Kozaburo, to Toyo Seikan Kaisha Ltd. Laminated plastic container and process for preparation thereof. 4,393,106, Cl. 428-35.000.

Maruishi Pharmaceutical Co., Ltd.: *See*—
Inoue, Koji; Sato, Nobukatsu; and Tamura, Takashi, 4,393,219, Cl. 548-534.000.

Maruta, Rikio; and Tomozawa, Atsushi, to Nippon Electric Co., Ltd. Digital compandor having nonlinear companding characteristics. 4,393,367, Cl. 340-347.0DD.

Maruzen Kasei Kabushiki Kaisha: *See*—
Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,393,200, Cl. 536-18.100.

Marx, Hans-Jurgen: *See*—
Leifeld, Ferdinand; Marx, Hans-Jurgen; and Scheuermann, Rolf, 4,392,275, Cl. 19-81.000.

Mason, Arthur D., Jr.; Johnson, Avery A., Jr.; Walker, Harrel L.; Bowler, Eleanor G.; and Ritchey, Charles R., to United States of

America, Army. Protective gel composition for wounds. 4,393,048, Cl. 424-132.000.
Mason, James V.; and Fisher, Mancil C. Safety bar. 4,392,660, Cl. 280-751.000.
Mast, Paul A.: *See—*
Fenrick, Walter J.; Chesney, Robert H.; and Mast, Paul A., 4,392,432, Cl. 102-334.000.
Master Craft Boat Company: *See—*
Shirley, Robert L., 4,392,448, Cl. 114-271.000.
Masuda, Toru, to Hoshiden Electronics Co., Ltd. Jack with plug actuated slide switch. 4,393,283, Cl. 200-51.090.
Masuyama, Yoshinari. Dietary product containing glucomannan powder and method for preparing. 4,393,086, Cl. 426-74.000.
Masuzawa, Sigeaki; and Kihara, Yoshiro, to Sharp Kabushiki Kaisha. Simultaneous electronic translation device. 4,393,460, Cl. 364-900.000.
Matsu Kyu Kabushiki Kaisha: *See—*
Ohmori, Hiroyuki; Uchimura, Hiroshi; and Mikage, Yuzo, 4,393,281, Cl. 200-16.00D.
Matsuda, Yasumasa; Mukumoto, Kyoji; Sagae, Syoji; and Kasahara, Masatoshi, to Hitachi Koki Co., Ltd.; and Hitachi, Ltd. Liquid droplet projection apparatus. 4,393,388, Cl. 346-140.00R.
Matsuda, Yoshio, to Yoshida Kogyo K. K. Slide fastener stringer with vent holes. 4,392,363, Cl. 66-193.000.
Matsumura, Naotake: *See—*
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,393,231, Cl. 560-73.000.
Matsuo, Masami: *See—*
Tsuchiya, Takayoshi; and Matsuo, Masami, 4,392,664, Cl. 280-276.000.
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Koji; and Suzuki, Mitsuo, to Hitachi, Ltd. Door operation control apparatus. 4,393,342, Cl. 318-467.000.
Matsusaka, Osamu, to Mitsubishi Monsanto Chemical Company. Sterilizing process for foods by applying microwaves thereto. 4,393,088, Cl. 426-234.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Ikushima, Hiroshi; Baba, Takaaki; Sagishima, Takayuki; and Tanaka, Masanobu, 4,393,400, Cl. 358-92.000.
Kobayashi, Masaaki; Takeuchi, Akihiro; and Fujisawa, Kiyoji, 4,393,417, Cl. 360-10.300.
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,392,933, Cl. 204-403.000.
Ouchi, Hiromu; Nishida, Masamitsu; and Numata, Kazunori, 4,392,970, Cl. 252-62.900.
Shinohara, Koichi; and Fujita, Takashi, 4,393,091, Cl. 427-13.000.
Takeda, Koichi; and Sasano, Yoshiro, 4,393,449, Cl. 364-474.000.
Takeuchi, Akihiro; Kobayashi, Masaaki; and Fujisawa, Kiyoji, 4,393,416, Cl. 360-10.200.
Tanaka, Eiichi; Ishibasi, Noboru; and Inoue, Shojiro, 4,392,813, Cl. 431-76.000.
Yokobori, Nobuyoshi; Urayama, Masashi; Okamoto, Hiroshi; and Igarashi, Yoshiaki, 4,393,422, Cl. 360-73.000.
Matsushita Electric Works, Ltd.: *See—*
Minakuchi, Yoshikazu; Abiko, Toshio; and Inoue, Hiromitsu, 4,393,514, Cl. 455-336.000.
Nakano, Kunimitsu, 4,393,287, Cl. 200-144.00R.
Matsushita, Takeshi: *See—*
Nagai, Tamiji; and Matsushita, Takeshi, 4,393,337, Cl. 315-408.000.
Matsuzaki, Minoru; Kawauchi, Toshiei; Murakami, Tsugio; and Kishira, Hideo, to Kawasaki Steel Corporation. Burner for bottom fired furnace. 4,392,815, Cl. 431-175.000.
Mattel, Inc.: *See—*
Schwager, Frederic A., 4,392,279, Cl. 24-221.00R.
Mattingly, Glen R.; and Quintanares, Joseph A. Multiple outlet connecting means for self-contained positive pressure or demand regulated breathing apparatus. 4,392,490, Cl. 128-202.270.
Matulewicz, William N.: *See—*
Mohr, Paul H.; and Matulewicz, William N., 4,392,972, Cl. 252-75.000.
Matyas, Stephen M.: *See—*
Konheim, Alan G.; Matyas, Stephen M.; and Meyer, Carl H., 4,393,269, Cl. 178-22.080.
Maurer, Fritz, to Bayer Aktiengesellschaft. Preparation of 3-bromo-4-fluoro-benzoic acid. 4,393,232, Cl. 562-419.000.
May, Christian: *See—*
Lehr, Klaus; Heymer, Gero; May, Christian; and Klein, Hermann, 4,392,962, Cl. 210-688.000.
May, John B.: *See—*
Kellogg, Richard A.; May, John B.; and Johnson, Brian C., 4,393,501, Cl. 371-33.000.
McCall, John M.: *See—*
DeGeeter, Melvin J.; McCall, John M.; and Teagarden, Dirk L., 4,393,065, Cl. 424-251.000.
McClaflin, John R., to Boeing Company, The. Combined beam support for landing gear. 4,392,622, Cl. 244-102.00A.
McClaflin, John R.: *See—*
Munsen, Victor A.; and McClaflin, John R., 4,392,623, Cl. 244-102.00R.
McCoy, Reginald F.H. Television image positioning and combining system. 4,393,394, Cl. 358-22.000.
McDonald, Glen E., to United States of America, National Aeronautics and Space Administration. Method of forming oxide coatings. 4,392,920, Cl. 204-37.00R.
McDonnell Douglas Corporation: *See—*
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; Stacy, Robert A.; and Meyer, Danny D., 4,393,393, Cl. 357-81.000.
McElroy, David J., to Texas Instruments Incorporated. EPROM and RAM cell layout with equal pitch for use in fault tolerant memory device or the like. 4,393,474, Cl. 365-200.000.
McElroy, Marvin R.: *See—*
Hadfield, Frederick C.; and McElroy, Marvin R., 4,392,628, Cl. 248-202.100.
McEntee, Harry R.: *See—*
Ritzer, Alan; Hajjar, Abraham L.; McEntee, Harry R.; and Shade, Ray W., 4,393,229, Cl. 556-430.000.
McGinn, Michael, to Motorola, Inc. Crossover circuit for use in automatic gain control systems. 4,393,354, Cl. 330-280.000.
McGraw-Edison Company: *See—*
Gilker, Clyde, 4,393,431, Cl. 361-97.000.
McIntyre, James A. E. S. Crop or product carrier. 4,392,688, Cl. 298-22.00R.
McKee, Graham E.; Haaf, Franz; Hambrecht, Juergen; Benker, Klaus; Stephan, Rudolf; and Breuer, Hans, to BASF Aktiengesellschaft. Transparent impact-resistant molding material. 4,393,164, Cl. 525-83.000.
McKeefry, Jerry L.: *See—*
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., 4,392,844, Cl. 493-399.000.
McLaughlin, Ivan P.: *See—*
Barker, John C.; and McLaughlin, Ivan P., 4,393,108, Cl. 428-44.000.
McMenamin, Joseph C., to J. C. Schumacher Company. Vapor mass flow control system. 4,393,013, Cl. 261-64.00B.
McQuay-Perfex Inc.: *See—*
Johannsen, James R., 4,392,417, Cl. 98-1.500.
McWilliams, Joseph A., to Micropore International Limited. Electric radiant heater unit for a glass ceramic top cooker. 4,393,299, Cl. 219-446.000.
Mechanical Technology Incorporation: *See—*
Marks, David T., 4,392,350, Cl. 60-518.000.
Medtronic, Inc.: *See—*
Skarstad, Paul M.; Coury, Arthur J.; and Untereker, Darrel F., 4,393,125, Cl. 429-105.000.
Stanton, David J., 4,392,496, Cl. 128-423.00W.
Mehrotra, Gopi N., to RCA Corporation. Audio processor for single, channel, matrixed two-channel and un-matrixed two-channel signals. 4,393,489, Cl. 369-86.000.
Meier, Karl-Heinz: *See—*
Angersbach, Wolfgang; and Meier, Karl-Heinz, 4,393,343, Cl. 318-640.000.
Meijer, Johan F. R., to N.K.F. Groep B.V. Cable stranding apparatus and method of operating it. 4,392,342, Cl. 57-264.000.
Meiji Seika Kaisha, Ltd.: *See—*
Makabe, Osamu; Murai, Yasushi; Okonogi, Tuneo; Onodera, Masahiro; Koyama, Yoshiyuki; and Yoshida, Takashi, 4,393,058, Cl. 424-246.000.
Mellott, Lex A., to JLG Industries Inc. Industrial crane with rotary electrical connector. 4,392,698, Cl. 339-10.000.
Melocik, Kurt B., to Caterpillar Tractor Co. Control for dead engine lower. 4,392,415, Cl. 91-461.000.
Mentzel, Werner: *See—*
Blank, Heinz U.; Gabel, Eike; Goldschmitt, Ernst; and Mentzel, Werner, 4,393,234, Cl. 562-475.000.
Mercier, Jean P.: *See—*
Legras, Roger M. H.; Biebuyck, Jean-Jacques E. R. G.; and Mercier, Jean P., 4,393,178, Cl. 525-437.000.
Merck & Co., Inc.: *See—*
E[illegible]dwin, John J.; and Ponticello, Gerald S., 4,393,212, Cl. [illegible]46-286.000.
b[illegible]lis, Francis P.; and Smith, Gary E., 4,393,046, Cl. 424-117.000.
Sletzinger, Meyer, 4,393,242, Cl. 568-322.000.
Merenkov, Jury F.; Egorov, Vladimir D.; Stepanov, Valentin G.; and Popkov, Igor V. Electromagnetic induction pump. 4,392,786, Cl. 417-50.000.
Merger, Franz: *See—*
Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, 4,393,251, Cl. 568-811.000.
Hummerich, Rainer; Weiss, Wolfram; Merger, Franz; Immel, Guenther; Kraus, Hans-Joachim; and Peters, Karl-Clemens, 4,393,207, Cl. 544-196.000.
Merisinter S.p.A.: *See—*
Apuzzo, Gennaro, 4,392,800, Cl. 425-78.000.
Merkel, George; and Scharf, William D., to United States of America, Army. Source-region electromagnetic pulse simulator. 4,393,509, Cl. 376-156.000.
Merkel, Wulf; Bormann, Dieter; Mania, Dieter; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Thienylbenzoic acid derivatives. 4,393,072, Cl. 424-275.000.
Merritt, Robert C.; and Terwilliger, Gerald L., to Eaton Corporation. Induction system for supercharged engine. 4,392,472, Cl. 123-564.000.
Merz, Herbert: *See—*
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mierau, Joachim, 4,393,069, Cl. 424-265.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Bschorr, Oskar, 4,392,522, Cl. 152-341.000.

Metallurgie Hoboken-Overpelt: *See*—
Dompas, John M. A., 4,393,296, Cl. 219-121.0PC.
Viellefont, Jean F.; and Dierckxsens, Robert P. L., 4,392,934, Cl. 204-198.000.

Mettler, Eduard, to Revue Thommen AG. Clock with rotatable ring. 4,392,750, Cl. 368-228.000.

Metz, Joseph R.; and Barnes, Michael F., to Norco, Inc. Releasable fastener. 4,392,281, Cl. 24-230.50R.

Metzger, Adolf; Konrad, Rolf; and Graser, Reinhold, to Hoechst Aktiengesellschaft. Process for the preparation of ammonium sulfamate. 4,393,033, Cl. 423-388.000.

Metzger, Karl G.: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; and Zeiler, Hans-Joachim, 4,393,051, Cl. 424-180.000.

Meusel, Wolfgang: *See*—
Fork, Kurt; Kaufhold, Wolfgang; Meusel, Wolfgang; and Waldmann, Hermann, 4,393,345, Cl. 322-19.000.

Meyer, Carl H.: *See*—
Konheim, Alan G.; Matyas, Stephen M.; and Meyer, Carl H., 4,393,269, Cl. 178-22.080.

Meyer, Danny D.: *See*—
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; Stacy, Robert A.; and Meyer, Danny D., 4,393,393, Cl. 357-81.000.

Meyer, Matthew. Apparatus for manufacturing cheese product. 4,392,801, Cl. 425-71.000.

Meyers, Gary W.: *See*—
Reed, Russell, Jr.; Burdette, George W.; Meyers, Gary W.; and Vuono, William R., 4,392,895, Cl. 149-19.300.

Meyers, Theodore F., to Hobart Corporation. Dishwasher soil collecting circuit. 4,392,891, Cl. 134-10.000.

Miard, Pierre V. L., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Method and device for the counting and management of asynchronous events emitted by peripheral devices in a data processing system. 4,393,470, Cl. 364-200.000.

Michaelson, Robert C.; and Austin, Richard G., to Exxon Research & Engineering Co. Hydroxylation of olefins. 4,393,253, Cl. 568-860.000.

Michaud, Franck, to Charles Hoffert of America, Inc. Manufacture of jewelry by casting with preset gems. 4,392,289, Cl. 29-160.600.

Michio, Abe; and Naoyuki, Maeda, to Tokai TRW & Co., Ltd. Power steering device for a vehicle. 4,392,540, Cl. 180-142.000.

Mickelsen, Reid A.; and Chen, Wen S., to Boeing Company, The. Apparatus for forming thin-film heterojunction solar cells employing materials selected from the class of I-III-VI_2 chalcopyrite compounds. 4,392,451, Cl. 118-690.000.

Microbiochemical Research Foundation: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Nakano, Hiroshi, 4,393,047, Cl. 424-118.000.

Micropore International Limited: *See*—
McWilliams, Joseph A., 4,393,299, Cl. 219-446.000.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. Fluorinated carbamate insecticides. 4,393,074, Cl. 424-285.000.

Mierau, Joachim: *See*—
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mierau, Joachim, 4,393,069, Cl. 424-265.000.

Miesen, Ernest: *See*—
Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, 4,393,251, Cl. 568-811.000.

Miida, Eishiro, to Tsukamoto Seiki Co., Ltd. Composite nozzle for earth boring and bore enlarging bits. 4,392,534, Cl. 175-340.000.

Mikage, Yuzo: *See*—
Ohmori, Hiroyuki; Uchimura, Hiroshi; and Mikage, Yuzo, 4,393,281, Cl. 200-16.00D.

Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, to Aisin-Warner Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Lockup controlling system for variable speed, automatic transmission. 4,393,467, Cl. 364-424.100.

Mikulich, Michael A.: *See*—
Burton, John H.; and Mikulich, Michael A., 4,392,562, Cl. 128-79.000.

Mikuriya, Takashi: *See*—
Okumura, Taketo; Tsukahara, Taiji; Mikuriya, Takashi; Watanabe, Hideki; and Katada, Katsutoshi, 4,392,371, Cl. 72-231.000.

Miles Laboratories, Inc.: *See*—
Helfrich, Elaine A.; and Yip, Kin F., 4,392,864, Cl. 8-506.000.
Schut, Robert N.; Safdy, Max E.; and Hong, Enrique, 4,393,081, Cl. 424-274.000.

Miller, James A.: *See*—
Miller, Toby D.; and Miller, James A., 4,392,665, Cl. 280-414.200.

Miller, Kenneth F., to General Electric Company. Hydrolytically stable polyester-carbonate compositions. 4,393,156, Cl. 524-114.000.

Miller, Kenneth F., to General Electric Company. Hydrolytically stable polycarbonate compositions. 4,393,158, Cl. 524-114.000.

Miller, Larry E.: *See*—
Mao, Mark H. K.; Miller, Larry E.; and Weeman, John M., 4,393,203, Cl. 536-124.000.

Miller Manufacturing Company: *See*—
Miller, Maurice E., 4,392,695, Cl. 308-187.200.

Miller, Maurice E., to Miller Manufacturing Company. Bearing. 4,392,695, Cl. 308-187.200.

Miller, Ronald E.; O'Hara, James E.; and Rola, Arthur E., to Quanex Corporation. Method and apparatus for charging lime into an electric arc furnace. 4,393,507, Cl. 373-81.000.

Miller, Ronald E.: *See*—
Eckert, Charles E.; and Miller, Ronald E., 4,392,888, Cl. 75-68.00R.

Miller, Toby D.; and Miller, James A. Boat dolly. 4,392,665, Cl. 280-414.200.

Milligan, Charles A.; Videki, Edwin R., II; and Yates, Winston F., to International Business Machines Corporation. Information-signal recording apparatus employing record volume oriented identification signals. 4,393,445, Cl. 364-200.000.

Milligan, Orley J. Solid fuel burning stove. 4,392,477, Cl. 126-77.000.

Milliken Research Corporation: *See*—
Gillespie, Ralph, 4,393,114, Cl. 428-252.000.
Godfrey, Thomas E., 4,392,366, Cl. 68-205.00R.

Millipore Corporation: *See*—
Ganzi, Gary C.; and Paul, Charles T., 4,392,958, Cl. 210-493.200.

Millman, William S., to Union Oil Company of California. Hydrocarbon conversion catalyst and method of preparation. 4,392,985, Cl. 252-435.000.

Minagawa, Hiroyasu, to Victor Company of Japan, Ltd. Negative feedback amplifying circuit having voltage negative feedback and current negative feedback circuits. 4,393,353, Cl. 330-102.000.

Minakuchi, Yoshikazu; Abiko, Toshio; and Inoue, Hiromitsu, to Matsushita Electric Works, Ltd. Superregenerative receiver. 4,393,514, Cl. 455-336.000.

Minami, Masaharu: *See*—
Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, 4,393,294, Cl. 219-121.0EC.

Minkey Farms Partnership: *See*—
Harris, Jeff; Chambers, Charles A.; and Horwitz, Jack M., 4,392,324, Cl. 46-1.00F.

Minkler, Bernd, to Dornier GmbH. Launch for carrying and launching flying bodies, in particular for aircraft. 4,392,411, Cl. 89-1.819.

Minner, Willy, to Licentia Patent-Verwaltungs-GmbH. Electronic ignition system. 4,392,474, Cl. 123-644.000.

Minnesota Mining and Manufacturing Company: *See*—
Moris, Alfred H., 4,393,423, Cl. 360-93.000.

Minolta Camera Co., Ltd.: *See*—
Sugiura, Masamichi; and Shibazaki, Kenji, 4,393,375, Cl. 340-700.000.

Minolta Camera Kabushiki Kaisha: *See*—
Beppu, Norio; and Fujii, Akira, 4,392,733, Cl. 354-266.000.
Ito, Masazumi; and Shibazaki, Kenji, 4,392,740, Cl. 355-14.0SH.
Oka, Tateki, 4,392,735, Cl. 355-3.0DD.
Sahara, Masayoshi; Nakai, Masaaki; Ishida, Tokuji; and Hosomizu, Hiroshi, 4,392,727, Cl. 354-43.000.

Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, to Daikin Kogyo Co., Ltd. Fluorine-containing phenyl benzoate compounds, and their production and use. 4,393,231, Cl. 560-73.000.

Miscioscio, Kathleen B.; and Smith, Paul T., to Occidental Chemical Corporation. Composition and process for electroplating white palladium. 4,392,921, Cl. 204-47.000.

Miskel, John J., Jr.: *See*—
Lipowski, Stanley A.; and Miskel, John J., Jr., 4,392,917, Cl. 162-168.100.

Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, to Mitsui Toatsu Chemicals, Inc. Cyclization process for producing aziridine-2-carboxylic acid or its salts. 4,393,000, Cl. 260-239.00E.

Mitchell, Alan; and Bailey, Thomas, to Imperial Chemical Industries PLC. Process for producing p-hydroxyphenyl/acetic acid. 4,393,235, Cl. 562-478.000.

Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Catalytic conversion. 4,393,255, Cl. 568-902.000.

Mitote, Tamio: *See*—
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,393,231, Cl. 560-73.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kimura, Hiroshi; and Kai, Junjiro, 4,392,971, Cl. 252-70.000.
Nakanishi, Yasuyuki, 4,393,426, Cl. 360-105.000.
Okuda, Kuniteru; Fukami, Teruki; Asayama, Yoshiaki; Wada, Shunichi; and Kabuto, Masami, 4,392,385, Cl. 73-861.230.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Gaku, Morio; Ikeguchi, Nobuyuki; and Ayano, Satoshi, 4,393,195, Cl. 528-361.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, 4,393,294, Cl. 219-121.0EC.

Mitsubishi Monsanto Chemical Company: *See*—
Matsusaka, Osamu, 4,393,088, Cl. 426-234.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, 4,393,000, Cl. 260-239.00E.

Mittelbach, Gunter; Horstmann, Gunter; Heiss, Werner; Hoffmann, Dietrich; Siebrecht, Gunter; Kriechbaum, Karl; and Rapp, Gunter, to Licentia Patent-Verwaltungs-GmbH. Puffer-type gas blast switch. 4,393,290, Cl. 200-148.00A.

Miura, Teiji: *See*—
Aoki, Kenji; Goto, Mitsuhiro; and Miura, Teiji, 4,393,390, Cl. 346-155.000.

Miyagi, Hideo; Suematsu, Toshio; Nakano, Jiro; and Ono, Hironobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for operating fuel injector in a computer controlled fuel injection type internal combustion engine. 4,392,467, Cl. 123-325.000.

Miyagi, Hideo; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the air-fuel ratio in an internal combustion engine. 4,392,471, Cl. 123-489.000.

Miyahara, Kosuke: *See*—
Kojima, Chiaki; Hasegawa, Kayoko; and Miyahara, Kosuke, 4,393,126, Cl. 430-2.000.

Miyake, Hidekazu: *See*—
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, 4,393,210, Cl. 546-141.000.

Miyamoto, Mitsuyasu; Ishimaru, Osamu; and Fukube, Nobuyoshi, to Hisaka Works, Ltd. Apparatus for treating textile material for continuous length. 4,392,365, Cl. 68-19.000.

Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. AM Stereo receiver. 4,393,274, Cl. 179-1.0GS.

Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, to Maruzen Kasei Kabushiki Kaisha. 18 α-Glycyrrhizinic acid and salt thereof. 4,393,200, Cl. 536-18.100.

Miyata, Toshiyuki: *See*—
Hirashima, Tsuneaki; Miyata, Toshiyuki; Yamamoto, Yoshikazu; and Kato, Mitsuyuki, 4,393,216, Cl. 548-305.000.

Miyoshi, Allan M. Telephone security system. 4,393,278, Cl. 179-84.00C.

Mizuno, Shigeo: *See*—
Arakawa, Kaneyasu; and Mizuno, Shigeo, 4,393,360, Cl. 335-164.000.

Mizuno, Yutaka: *See*—
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.

Moberg, Carl E. Steering and propulsion system for marine use. 4,392,832, Cl. 440-49.000.

Mobil Oil Corporation: *See*—
Audeh, Costandi A.; and Greco, Saverio G., 4,392,947, Cl. 208-229.000.
Chu, Yung F.; and Chester, Arthur W., 4,392,989, Cl. 252-455.00Z.
Herrington, Fox J., 4,392,897, Cl. 156-66.000.
Kaeding, Warren W., 4,393,262, Cl. 585-467.000.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,393,255, Cl. 568-902.000.
Odeh, Aziz S.; and Dotson, Billy J., 4,392,530, Cl. 166-269.000.
Tobias, Michael A.; and Lynch, Conrad L., 4,393,121, Cl. 428-458.000.

Moen, Tor: *See*—
Danielsen, Petter; and Moen, Tor, 4,393,378, Cl. 340-744.000.

Moessinger, Albert. Weaving loom with a waving shed having an improved frame. 4,392,515, Cl. 139-55.100.

Mogi, Shigeru: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.

Mohr, Paul H.; and Matulewicz, William N., to Union Carbide Corporation. Aluminum-corrosion inhibitive heat transfer fluid. 4,392,972, Cl. 252-75.000.

Molina, Orlando G., to Rockwell International Corporation. Extended biodegradable dye penetrant composition. 4,392,982, Cl. 252-408.100.

Molins Limited: *See*—
Fox, Austin L., 4,392,338, Cl. 53-462.000.
Horsley, John K., 4,392,912, Cl. 156-504.000.

Momose, Yoshiaki: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hideo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,393,016, Cl. 264-53.000.

Monarch Marking Systems, Inc.: *See*—
Jenkins, William A., 4,393,107, Cl. 428-42.000.

Moncada, Salvador E., to Burroughs Wellcome Co. Treatment for gastric lesions. 4,393,063, Cl. 424-251.000.

Monno, Asao: *See*—
Shimizu, Masami; and Monno, Asao, 4,393,305, Cl. 250-358.100.

Mons, Claude M.: *See*—
Tirole, Jacques P. H.; Mons, Claude M.; and Spinat, Roland R., 4,392,656, Cl. 277-53.000.

Monterey Manufacturing, Inc.: *See*—
Hall, Charles P.; and Johenning, John B., 4,392,872, Cl. 55-36.000.

Montgomery, Loren N., to General Motors Corporation. Dual engine drive. 4,392,393, Cl. 74-661.000.

Monzer, Pierre: *See*—
Rivollet, Marc; and Monzer, Pierre, 4,393,284, Cl. 200-60.000.

Moody, Brian R.; Lowe, Duncan B.; and Lowe, Derek W., to United Kingdom Atomic Energy Authority. Transport apparatus. 4,392,435, Cl. 104-284.000.

Moontasir, Hussain A. Soap holders. 4,392,630, Cl. 248-309.00R.

Moore, Anthony J.; and Silver, Howard B., to British Petroleum Company Limited, The. Method for transmitting power by traction utilizing borate esters as traction fluids and a device for using the method. 4,392,973, Cl. 252-78.100.

Moore, Robert H.; and Engels, Larry O. Pavement milling apparatus. 4,392,689, Cl. 299-39.000.

Moore, Stanley W., to United States of America, Energy. Solar collector apparatus having increased energy rejection during stagnation. 4,392,481, Cl. 126-418.000.

Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Process and apparatus for rendering visible charge images. 4,392,711, Cl. 350-361.000.

Morgan, Chester S.: *See*—
Lauf, Robert J.; and Morgan, Chester S., 4,393,124, Cl. 429-104.000.

Morgan, Jeffrey D.: *See*—
Spradlin, Joseph E.; Morgan, Jeffrey D.; Olson, Allan R.; and Howley, Joseph P., 4,393,085, Cl. 426-28.000.

Morgan-Smith Electronics Ltd.: *See*—
Morgan-Smith, Peter J., 4,393,371, Cl. 340-347.0AD.

Morgan-Smith, Peter J., to Morgan-Smith Electronics Ltd. Analogue to digital signal conversion and storage system. 4,393,371, Cl. 340-347.0AD.

Mori, Fumio: *See*—
Itsubo, Junichi; Mori, Fumio; and Sato, Hideki, 4,392,581, Cl. 215-348.000.

Mori, Mamoru: *See*—
Yamamoto, Toshimasa; Mori, Mamoru; and Kinaga, Eiichi, 4,392,672, Cl. 280-803.000.

Morimoto, Makoto: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Kasai, Masaji; Hirayama, Noriaki; Morimoto, Makoto; and Fukui, Masanori, 4,393,056, Cl. 424-181.000.

Morimoto, Shigeo: *See*—
Sawada, Jiro; Hanada, Kazunori; Tamai, Masaharu; Morimoto, Shigeo; and Omura, Sadafumi, 4,393,228, Cl. 549-549.000.

Moris, Alfred H., to Minnesota Mining and Manufacturing Company. Endless loop tape magazine, and a recording and/or playback machine utilizing the magazine. 4,393,423, Cl. 360-93.000.

Morishita, Hirosada: *See*—
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.

Morishita, Hitoshi: *See*—
Kodaka, Mikio; Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, 4,392,886, Cl. 75-52.000.

Moriwaki, Takeshi; and Tokuhara, Shinji, to Daicel Chemical Industries, Ltd. Moldable resin compositions containing polycarbonate styrene polymer and three phase graft polymer. 4,393,169, Cl. 525-67.000.

Moroi, Hayato: *See*—
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,267, Cl. 15-88.000.
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,506, Cl. 134-46.000.

Morrison, John M., to Ferranti Limited (now Ferranti plc). Resistive electrode LCD and voltage supply means. 4,392,718, Cl. 350-336.000.

Morrow, Charles M.: *See*—
Reed, Charles F.; and Morrow, Charles M., 4,392,585, Cl. 221-1.000.

Moskal, John F. Heat scavenger. 4,392,610, Cl. 237-5.00S.

Motonami, Masanao: *See*—
Suzuki, Ichiro; Yasumatsu, Jun; Imai, Yoshikazu; and Motonami, Masanao, 4,392,673, Cl. 280-804.000.

Motorola, Inc.: *See*—
Davis, William F.; and Shacter, Stuart B., 4,393,355, Cl. 330-294.000.
Gill, Graham P., 4,393,092, Cl. 427-38.000.
McGinn, Michael, 4,393,354, Cl. 330-280.000.
Myers, Donald O., 4,392,382, Cl. 73-708.000.
Paulson, Wayne M.; and Hughes, David W., 4,392,992, Cl. 252-512.000.
Rasmussen, Erling E., 4,393,368, Cl. 340-347.0AD.
Whalin, Jeffery A.; Shanley, Charles W.; Scansaroli, Michael N.; and Dworsky, Lawrence N., 4,393,131, Cl. 430-320.000.

Mouille, Rene' L.; Gallot, Jacques R.; and Pouradier, Jean-Marc E., to Societe Nationale Industrielle Aerospatiale. High performance blade for helicopter rotor. 4,392,781, Cl. 416-223.00R.

Mowbray, Dorian F.; and Jarrett, Boaz A., to Lucas Industries Limited. Fuel system for engines. 4,392,466, Cl. 123-299.000.

Mowbray, Dorian F., to Lucas Industries Limited. Fuel pumping apparatus. 4,392,793, Cl. 417-462.000.

Muessel, Dan C.; and Hagopian, Nubar, to Rule Industries, Inc. Rotary power coupling and planetary gear winch. 4,392,635, Cl. 254-344.000.

Mugglestone, Peter R., to Illinois Tool Works Inc. Fastener. 4,392,278, Cl. 24-213.00R.

Muhlich, Albert: *See*—
Bonewitz, Hans-Ulrich; Muhlich, Albert; and Rau, Karlheinz, 4,392,715, Cl. 350-96.330.

Mukumoto, Kyoji: *See*—
Matsuda, Yasumasa; Mukumoto, Kyoji; Sagae, Syoji; and Kasahara, Masatoshi, 4,393,388, Cl. 346-140.00R.

Mulholland, Lawrence K. Shock-absorbing wheel suspension assembly. 4,392,668, Cl. 280-721.000.

Muller, Manfred, to Daimler-Benz Aktiengesellschaft. Lock tongue for safety belts. 4,392,277, Cl. 24-196.000.

Muller, Paul: *See*—
Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, 4,392,999, Cl. 260-157.000.

Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, to Ciba-Geigy Corporation. Monoazo pigments containing hydroxynaphthoylamino benzimidazolone radical. 4,392,999, Cl. 260-157.000.

Muller, Theo: *See*—
Fabian, Peter; and Muller, Theo, 4,392,927, Cl. 204-98.000.

Munsen, Victor A.; and McClaflin, John R., to Boeing Company, The. Fused connection adapted to fail under different overloads acting in different directions. 4,392,623, Cl. 244-102.00R.

Murai, Yasushi: *See*—
Makabe, Osamu; Murai, Yasushi; Okonogi, Tuneo; Onodera, Masahiro; Koyama, Yoshiyuki; and Yoshida, Takashi, 4,393,058, Cl. 424-246.000.
Murakami, Koichi: *See*—
Inuzuka, Tsuneki; Murakami, Koichi; Kurita, Kenji; and Sakamaki, Hisashi, 4,392,741, Cl. 355-14.00R.
Murakami, Masatsugi: *See*—
Yoshii, Toshiya; Nakura, Satoru; and Murakami, Masatsugi, 4,393,115, Cl. 428-323.000.
Murakami, Tsugio: *See*—
Matsuzaki, Minoru; Kawauchi, Toshiei; Murakami, Tsugio; and Kishira, Hideo, 4,392,815, Cl. 431-175.000.
Murotani, Tatsunori, to Nippon Electric Co., Ltd. Temperature responsive refresh control circuit. 4,393,477, Cl. 365-222.000.
Murray Ohio Manufacturing Co., The: *See*—
Buckhouse, Norman O.; Stevens, Aaron A.; and Lawrence, Randall K., 4,392,543, Cl. 180-272.000.
Murray, Robert M. S.: *See*—
Pitches, Brian E.; Murray, Robert M. S.; and Rogers, Douglas J., 4,392,378, Cl. 73-304.00C.
Muschaweck, Roman: *See*—
Merkel, Wulf; Bormann, Dieter; Mania, Dieter; and Muschaweck, Roman, 4,393,072, Cl. 424-275.000.
Muto, Rudolph. Sterile assembly for protecting and fastening an indwelling device. 4,392,853, Cl. 604-171.000.
Myer, Robert J., to United States of America, Air Force. Implanted boundary layer trip. 4,392,624, Cl. 244-158.00A.
Myers, Donald O., to Motorola Inc. Linearized electronic capacitive pressure transducer. 4,392,382, Cl. 73-708.000.
N.K.F. Groep B.V.: *See*—
Meijer, Johan F. R., 4,392,342, Cl. 57-264.000.
Nabeta, Yoichi: *See*—
Imai, Yoshio; Nabeta, Yoichi; and Inuzuka, Tadao, 4,393,434, Cl. 361-286.000.
Nabisco Brands, Inc.: *See*—
Pomper, Seymour; and LaBaw, Glenn D., 4,393,084, Cl. 426-19.000.
Naf, Ferdinand: *See*—
Thomas, Alan F.; and Naf, Ferdinand, 4,392,993, Cl. 252-522.00R.
Nagai, Shosuke: *See*—
Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, 4,393,000, Cl. 260-239.00E.
Nagai, Tamiji; and Matsushita, Takeshi, to Sony Corporation. Switching circuit. 4,393,337, Cl. 315-408.000.
Naganoma, Masanori: *See*—
Kondo, Nobuo; Naganoma, Masanori; Hibi, Hitoshi; Fujii, Tetsuo; and Suzuki, Kunihiko, 4,393,365, Cl. 340-57.000.
Nagl, Michael: *See*—
Weber, Ralph; Rollinger, Bernt; Nagl, Michael; and Rinner, Bernhard, 4,392,637, Cl. 266-265.000.
Nagy, Dennis J.: *See*—
Daniels, Wiley E.; and Nagy, Dennis J., 4,393,173, Cl. 525-329.400.
Nair, Vijay G.; Joseph, Joseph P.; and Bernstein, Seymour, to American Cyanamid Company. Hydroxyalkyl ether derivatives of rutin poly(H-)sulfate and method of use. 4,393,055, Cl. 424-180.000.
Nakagawa, Akira: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Tetsuya; and Ide, Hiroyuki, 4,393,076, Cl. 424-317.000.
Nakagawa, Tsuneo; Hiramatsu, Uji; and Honda, Toshihide, to Daikin Kogyo Co., Ltd. Process for preparing benzotrifluoride and its derivatives. 4,393,257, Cl. 570-145.000.
Nakai, Masaaki: *See*—
Sahara, Masayoshi; Nakai, Masaaki; Ishida, Tokuji; and Hosomizu, Hiroshi, 4,392,727, Cl. 354-43.000.
Nakajima, Isao; Tagusari, Koji; Okuna, Kenji; Hayama, Toru; Takahashi, Kazue; Watanabe, Michihiro; and Kotani, Sumihisa, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Printing hammer driving apparatus. 4,392,423, Cl. 101-93.480.
Nakajima, Masao: *See*—
Fujiu, Takahiro; Nakajima, Masao; and Okano, Shigeru, 4,392,265, Cl. 8-120.000.
Nakamine, Chosin, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic copying apparatus for forming multiple images on a single sheet. 4,392,736, Cl. 355-3.00R.
Nakamori, Shigeru: *See*—
Tsuchida, Takayasu; and Nakamori, Shigeru, 4,393,135, Cl. 435-110.000.
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, to Matsushita Electric Industrial Co., Ltd. Electrochemical measuring apparatus comprising enzyme electrode. 4,392,933, Cl. 204-403.000.
Nakamura, Teruo; and Iino, Umetarou, to Diesel Kiki Co., Ltd. Swash-plate type compressor having oil separating function. 4,392,788, Cl. 417-269.000.
Nakanishi, Tosaku: *See*—
Tanimoto, Akira; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,393,462, Cl. 364-900.000.
Nakanishi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Tape recorder head adjusting mechanism. 4,393,426, Cl. 360-105.000.
Nakano, Akira. Region information processing system. 4,393,453, Cl. 364-514.000.
Nakano, Hiroshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Nakano, Hiroshi, 4,393,047, Cl. 424-118.000.
Nakano, Jiro: *See*—
Miyagi, Hideo; Suematsu, Toshio; Nakano, Jiro; and Ono, Hironobu, 4,392,467, Cl. 123-325.000.
Miyagi, Hideo; and Nakano, Jiro, 4,392,471, Cl. 123-489.000.
Nakano, Kunimitsu, to Matsushita Electric Works, Ltd. Arc suppressing means for current limiting circuit breakers. 4,393,287, Cl. 200-144.00R.
Nakao, Sho: *See*—
Shiba, Keisuke; Nakao, Sho; and Toyama, Tadao, 4,393,128, Cl. 430-273.000.
Nakashima, Humihiko: *See*—
Sakudo, Noriyuki; Tokiquchi, Katsumi; Koike, Hidemi; Kanomata, Ichiro; and Nakashima, Humihiko, 4,393,333, Cl. 315-111.810.
Nakasu, Kei; Ichikawa, Shigeru; Tanaka, Toshihiko; and Ikeda, Mitsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Disc brake with a caliper supported by slide pins. 4,392,560, Cl. 188-73.340.
Nakayama, Mituhito: *See*—
Shibata, Tomoyuki; Nakayama, Mituhito; and Ouchi, Kiyoshi, 4,392,790, Cl. 417-360.000.
Nakazawa, Mitsuaki: *See*—
Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, 4,392,421, Cl. 99-524.000.
Nakura, Satoru: *See*—
Yoshii, Toshiya; Nakura, Satoru; and Murakami, Masatsugi, 4,393,115, Cl. 428-323.000.
Nankai, Shiro: *See*—
Nakamura, Kenichi; Nankai, Shiro; and Iijima, Takashi, 4,392,933, Cl. 204-403.000.
Naoyuki, Maeda: *See*—
Michio, Abe; and Naoyuki, Maeda, 4,392,540, Cl. 180-142.000.
Narahara, Toshikazu: *See*—
Ishii, Takeo; Ogata, Masatsugu; and Narahara, Toshikazu, 4,393,177, Cl. 525-422.000.
Nash Engineering Company, The: *See*—
Jozepaitis, Charles M., 4,392,783, Cl. 417-68.000.
National Semiconductor Corporation: *See*—
Husain, Syed A., 4,392,935, Cl. 204-206.000.
National Starch and Chemical Corporation: *See*—
Breuninger, William F., 4,393,202, Cl. 536-102.000.
National Union Electric Corporation: *See*—
Sepke, Arnold L., 4,392,271, Cl. 15-339.000.
Nawroth, Werner: *See*—
Heckmann, Horst; and Nawroth, Werner, 4,392,510, Cl. 137-454.200.
NCR Corporation: *See*—
Knapp, George W.; and Spaulding, Bernard B., 4,393,464, Cl. 364-900.000.
Porter, Warren W., 4,392,704, Cl. 339-75.0MP.
Neal, Danny M.: *See*—
Bowles, David J.; Clancy, Douglas E.; Johnson, Carl F.; and Neal, Danny M., 4,392,758, Cl. 400-697.100.
Necchi Societa per Azioni: *See*—
Bar, Alfredo, 4,392,789, Cl. 417-312.000.
Nehmey, Sam D.: *See*—
Kim, Hueng T.; and Nehmey, Sam D., 4,393,017, Cl. 264-53.000.
Nelson, Alfred M.: *See*—
Rasekhi, Houshang; and Nelson, Alfred M., 4,393,389, Cl. 346-153.100.
Nemas, Mara: *See*—
Kraus, Menahem A.; Frommer, Moshe A.; Nemas, Mara; and Gutman, Rodika, 4,392,960, Cl. 210-651.000.
Neu, Hans: *See*—
Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, 4,393,282, Cl. 200-19.00R.
Neuhaus, Dieter; Sohner, Gerhard; Ruf, Walter; Jesse, Erich; and Roth, Helmut, to Robert Bosch GmbH. Safety device for a conducting path in a load device. 4,393,432, Cl. 361-104.000.
Neutrik Aktiengesellschaft: *See*—
Weingartner, Bernhard, 4,392,699, Cl. 339-14.00P.
New, Bernard J., to Advanced Micro Devices, Inc. Method and apparatus for sequencing addresses of a fast Fourier transform array. 4,393,457, Cl. 364-726.000.
New, Bernard J., to Advanced Micro Devices, Inc. Bit slice microprogrammable processor for signal processing applications. 4,393,468, Cl. 364-736.000.
Newton, Alan B.: *See*—
Holmes, Paul A.; Willmouth, Frank M.; and Newton, Alan B., 4,393,167, Cl. 525-64.000.
Newton, Richard P.; Harper, Patrick H.; Geiss, Vernon L.; and Jewell, John N., to Brown & Williamson Tobacco Corporation. Method of processing fresh tobacco leaves. 4,392,501, Cl. 131-300.000.
NGK Insulators, Ltd.: *See*—
Izumi, Naoe, 4,392,387, Cl. 73-863.210.
NGK Spark Plug Co.: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,393,324, Cl. 313-133.000.
Nguyen, Nghia V.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,393,448, Cl. 364-449.000.
Niederholtmeyer, Werner G. Process and apparatus for utilizing waste oil. 4,392,820, Cl. 431-284.000.
Niemeijer, Halbe J., to Dawsonville Corp., N.V. Tattooing apparatus. 4,392,493, Cl. 128-316.000.

Nifco, Inc.: *See*—
Hara, Kunio, 4,392,337, Cl. 53-48.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; and Kume, Toyohiko, 4,392,929, Cl. 204-158.0HA.
Niinivaara, Juhani, to Asonen, Osmo. Method for the arc cutting of metal. 4,393,297, Cl. 219-137.00R.
Nimry, Tayseer S.; and Fields, Ellis K., to Standard Oil Company (Indiana). Tricyclo[6.4.0.0^{2,7}] dodecane-3,6-diphenyl-1,8,4,5-tetracarboxylic acid dianhydrides. 4,393,222, Cl. 549-234.000.
Nippon Electric Co., Ltd.: *See*—
Hareyama, Kyuichi, 4,393,370, Cl. 340-347.0DA.
Maruta, Rikio; and Tomozawa, Atsushi, 4,393,367, Cl. 340-347.0DD.
Murotani, Tatsunori, 4,393,477, Cl. 365-222.000.
Yamashita, Koji, 4,393,383, Cl. 343-903.000.
Nippon Elumin Sash Co., Ltd.: *See*—
Suzuki, Jyuji, 4,392,329, Cl. 49-356.000.
Nippon Hoso Kyokai: *See*—
Taketoshi, Kazuhisa; and Ogusu, Chihaya, 4,392,452, Cl. 118-723.000.
Nippon Kogaku K.K.: *See*—
Hamanishi, Yoshinari, 4,392,724, Cl. 350-163.000.
Nippon Oil Company, Limited: *See*—
Ishida, Noboru; and Watanabe, Harumichi, 4,392,968, Cl. 252-51.50R.
Nippon Telegraph and Telephone Public Corporation: *See*—
Itakura, Fumitada; and Sugamura, Noboru, 4,393,272, Cl. 179-1.0SA.
Nippondenso Co., Ltd.: *See*—
Eguchi, Osamu; Hattori, Mitsutoshi; and Hanaoka, Takatsugu, 4,392,375, Cl. 73-118.000.
Fujinami, Hiroshi; and Yamada, Takashi, 4,393,271, Cl. 179-1.0SM.
Kondo, Nobuo; Naganoma, Masanori; Hibi, Hitoshi; Fujii, Tetsuo; and Suzuki, Kunihiko, 4,393,365, Cl. 340-57.000.
Nishi, Norio: *See*—
Nishiyama, Masashi; Kobayashi, Yoshinari; Tokura, Seiichi; and Nishi, Norio, 4,392,916, Cl. 162-157.100.
Nishida, Hirotaka: *See*—
Maekawa, Hideyuki; Hiramoto, Shinji; Itaya, Kozo; Sato, Kokichi; and Nishida, Hirotaka, 4,392,577, Cl. 215-32.000.
Nishida, Masamitsu: *See*—
Ouchi, Hiromu; Nishida, Masamitsu; and Numata, Kazunori, 4,392,970, Cl. 252-62.900.
Nishikawa, Masaji, to Olympus Optical Co. Ltd. Electrophotographic copying apparatus. 4,392,737, Cl. 355-3.00R.
Nishimura, Tadashi: *See*—
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,267, Cl. 15-88.000.
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,506, Cl. 134-46.000.
Nishimura, Tatsuo: *See*—
Nishiyama, Masanobu; Kanazawa, Fusao; Tanaka, Hisaji; and Nishimura, Tatsuo, 4,392,269, Cl. 15-145.000.
Nishimura, Yukuo: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,392,907, Cl. 156-252.000.
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, to NGK Spark Plug Co. Spark plug with a sphere-like metal center electrode and manufacturing process thereof. 4,393,324, Cl. 313-133.000.
Nishiyama, Masanobu; Kanazawa, Fusao; Tanaka, Hisaji; and Nishimura, Tatsuo, to Duskin Franchise Kabushiki Kaisha; and Kabushiki Kaisha Sunpack. Mop carrier. 4,392,269, Cl. 15-145.000.
Nishiyama, Masashi; Kobayashi, Yoshinari; Tokura, Seiichi; and Nishi, Norio, to Director-General of the Agency of Industrial Science and Technology; and Hokkaido University, President of. Paper-making process with regenerated chitin fibers. 4,392,916, Cl. 162-157.100.
Nishiyama, Yoshihisa: *See*—
Fujii, Kunihiko; Hirosaki, Yukihiro; Nishiyama, Yoshihisa; and Sato, Koichiro, 4,392,535, Cl. 177-1.000.
Nissan Chemical Industries, Ltd.: *See*—
Ozawa, Kiyomi; and Ishii, Shigeru, 4,393,213, Cl. 546-298.000.
Nissan Motor Company, Limited: *See*—
Fujikawa, Tsuneo; and Takagishi, Haruyoshi, 4,392,601, Cl. 228-4.100.
Hiraiwa, Kazuyoshi; and Yamasaki, Saburo, 4,393,285, Cl. 200-61.880.
Kakimoto, Toshihiko, 4,392,640, Cl. 267-141.200.
Takahashi, Takao, 4,392,517, Cl. 139-435.000.
Yasuhara, Seishi, 4,392,463, Cl. 123-196.00M.
Yoshitsugu, Seikichi; and Shimatsu, Minoru, 4,392,684, Cl. 296-185.000.
Nisshin Flour Milling Co., Ltd.: *See*—
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,393,209, Cl. 544-404.000.
Nisshin Oil Mills Limited, The: *See*—
Takada, Atsunobu; and Higaki, Yuzo, 4,393,044, Cl. 424-59.000.
Nittetsu Steel Drum Co., Ltd.: *See*—
Sasai, Mitsuo; Tomikawa, Kiyozi; and Kajiwara, Kazuo, 4,392,295, Cl. 29-509.000.
Nitto Boseki Co., Ltd.: *See*—
Okuma, Kiwamu; Haga, Tsunehiro; Kizara, Masao; Otaki, Keiji; and Hirai, Ayahiro, 4,392,878, Cl. 65-6.000.
Nitto Chemical Industry, Co., Ltd.: *See*—
Kanda, Shoichi; and Kawamura, Gengiro, 4,393,163, Cl. 524-608.000.
Nix, Hans; and Szary, Herbert, to Elektro-Physik Hans Nix & Dr. Ing. E. Steingroever, K.G. Pencil shaped magnetic coating thickness gauge. 4,392,305, Cl. 33-169.00F.
NL Industries, Inc.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,392,964, Cl. 252-8.50C.
Noblit, William D., III: *See*—
Gorenflo, Donald L.; and Noblit, William D., III, 4,393,401, Cl. 358-107.000.
Noda, Kanji; Nakagawa, Akira; Yamagata, Tetsuya; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Anti-inflammatory and analgesic gel composition. 4,393,076, Cl. 424-317.000.
Nokami, Junzo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,392,923, Cl. 204-59.00R.
Nolting, Karl-Heinz: *See*—
Bruggendieck, Siegfried; Nolting, Karl-Heinz; Krahn, Friedrich; and Olejak, Gerhard, 4,392,714, Cl. 350-96.230.
Nomiyama, Neal T.: *See*—
Buser, Rudolph G.; Osche, Gregory R.; Nomiyama, Neal T.; and Rohde, Robert S., 4,393,517, Cl. 455-608.000.
Norco, Inc.: *See*—
Metz, Joseph R.; and Barnes, Michael F., 4,392,281, Cl. 24-230.50R.
Norioka, Setsuo, to JEOL Ltd. Method and apparatus for controlling the objective lens in a scanning electron microscope or the like. 4,393,309, Cl. 250-396.00R.
Norjay Services, Ltd.: *See*—
Redmond, Harry W.; and Jeannotte, Raymond V., 4,392,658, Cl. 280-11.180.
Norkus, Kasper, Jr. Expansible and retractable vehicle body. 4,392,682, Cl. 296-26.000.
Noroy, Terje. Apparatus for pulling-off the skin of sheep carcasses in slaughtering. 4,392,274, Cl. 17-21.000.
North American Philips Electric Corp.: *See*—
Skwirut, Henry; and Young, Robert G., 4,393,330, Cl. 313-487.000.
Northern Telecom Limited: *See*—
Anderson, James E.; Lee, John D.; and Livermore, Frederick C., 4,393,433, Cl. 361-119.000.
Maniv, Shmuel; and Westwood, William D., 4,392,931, Cl. 204-192.00R.
Northwestern University: *See*—
Goldberg, Erwin, 4,392,997, Cl. 260-112.50R.
Norwich Eaton Pharmaceuticals, Inc.: *See*—
Alaimo, Robert J., 4,393,208, Cl. 544-343.000.
Pelosi, Stanford S., Jr., 4,393,204, Cl. 542-420.000.
Notta, Adolf, to Wetrok Inc. Diaphragm pump. 4,392,787, Cl. 417-269.000.
Novoselac, John; and Churcher, Dale L., to Joy Manufacturing Company. Centrifuge apparatus. 4,392,846, Cl. 494-40.000.
Noyes, Steven S.: *See*—
Holtey, Thomas O.; Noyes, Steven S.; and Peters, Daniel G., 4,393,461, Cl. 364-900.000.
Nozaki, Shinichi; Tai, Ichiro; and Shirayama, Shimpey, to Tokyo Shibaura Denki Kabushiki Kaisha. Neutron detectors. 4,393,307, Cl. 250-390.000.
Numata, Kazunori: *See*—
Ouchi, Hiromu; Nishida, Masamitsu; and Numata, Kazunori, 4,392,970, Cl. 252-62.900.
Numata, Seiji: *See*—
Maki, Naoki; Numata, Seiji; Yamaguchi, Kiyoshi; and Yamamoto, Heroe, 4,393,429, Cl. 361-19.000.
Nussbaumer, Dietmar: *See*—
Perl, Horst; Nussbaumer, Dietmar; Klaver, Horst; and Beer, Hans, 4,392,963, Cl. 210-692.000.
Nussenbaum, Joseph: *See*—
Gresser, Herbert D.; Kaplan, George; and Nussenbaum, Joseph, 4,392,476, Cl. 125-30.00R.
Nyland, Clifford A., to Railroad Service, Inc. Railway maintenance machine. 4,392,433, Cl. 104-9.000.
Occidental Chemical Corporation: *See*—
Miscioscio, Kathleen B.; and Smith, Paul T., 4,392,921, Cl. 204-47.000.
Tomaszewski, Thaddeus W., 4,392,922, Cl. 204-51.000.
Ochs, Charles S., to Anchor Hocking Corporation. Closure cap. 4,392,580, Cl. 215-332.000.
O'Connell, Denis, to Institute for Industrial Research & Standards. Lifting and tilting trailer. 4,392,687, Cl. 298-5.000.
Odeh, Aziz S.; and Dotson, Billy J., to Mobil Oil Corporation. Method of improved oil recovery by simultaneous injection of steam and water. 4,392,530, Cl. 166-269.000.
Ogata, Masatsugu: *See*—
Ishii, Takeo; Ogata, Masatsugu; and Narahara, Toshikazu, 4,393,177, Cl. 525-422.000.
Ogusu, Chihaya: *See*—
Taketoshi, Kazuhisa; and Ogusu, Chihaya, 4,392,452, Cl. 118-723.000.
O'Hara, James E.: *See*—
Miller, Ronald E.; O'Hara, James E.; and Rola, Arthur E., 4,393,507, Cl. 373-81.000.
Ohashi, Takashi: *See*—
Kaneda, Hiroshi; Arai, Katsuhiko; Suzuki, Akira; and Ohashi, Takashi, 4,393,015, Cl. 264-51.000.

Ohhata, Michinobu: *See*—
Takahashi, Masayuki; Goto, Kunihiko; Tanaka, Hisami; and Ohhata, Michinobu, 4,393,318, Cl. 307-353.000.

Ohio State University Research Foundation, The: *See*—
Witiak, Donald T.; and Rahwan, Ralf G., 4,393,226, Cl. 549-433.000.

Ohlrogge, Alvin J.: *See*—
White, Joe L.; and Ohlrogge, Alvin J., 4,393,082, Cl. 426-2.000.

Ohmori, Hiroyuki; Uchimura, Hiroshi; and Mikage, Yuzo, to Matsu Kyu Kabushiki Kaisha. Dip switch. 4,393,281, Cl. 200-16.00D.

Ohnishi, Hiroyuki: *See*—
Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, 4,393,258, Cl. 585-25.000.

Ohta, Teruto; and Kinoshita, Yoshio, to Showa Aluminum Industries K.K. Process and apparatus for production of aluminum. 4,392,926, Cl. 204-67.000.

Ohtani, Osamu: *See*—
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, 4,393,210, Cl. 546-141.000.

Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Magnetic brush developing apparatus. 4,392,735, Cl. 355-3.0DD.

Okabe, Masao: *See*—
Tatsuhama, Tetsuro; and Okabe, Masao, 4,392,744, Cl. 356-153.000.

Okada, Kenzo: *See*—
Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,393,200, Cl. 536-18.100.

Okamoto, Hiroshi: *See*—
Yokobori, Nobuyoshi; Urayama, Masashi; Okamoto, Hiroshi; and Igarashi, Yoshiaki, 4,393,422, Cl. 360-73.000.

Okano, Shigeru: *See*—
Fujiu, Takahiro; Nakajima, Masao; and Okano, Shigeru, 4,392,265, Cl. 8-120.000.

Okaya Electric Industries Co., Ltd.: *See*—
Kamegaya, Takeo; and Watanabe, Satoshi, 4,393,326, Cl. 313-582.000.

Okonogi, Tuneo: *See*—
Makabe, Osamu; Murai, Yasushi; Okonogi, Tuneo; Onodera, Masahiro; Koyama, Yoshiyuki; and Yoshida, Takashi, 4,393,058, Cl. 424-246.000.

Okuda, Kuniteru; Fukami, Teruki; Asayama, Yoshiaki; Wada, Shunichi; and Kabuto, Masami, to Oval Engineering Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Flow meter utilizing Karman vortex street. 4,392,385, Cl. 73-861.230.

Okuma, Kiwamu; Haga, Tsunehiro; Kizara, Masao; Otaki, Keiji; and Hirai, Ayahiro, to Nitto Boseki Co., Ltd. Glass fiber forming unit. 4,392,878, Cl. 65-6.000.

Okumura Corporation: *See*—
Tatsuhama, Tetsuro; and Okabe, Masao, 4,392,744, Cl. 356-153.000.

Okumura, Taketo; Tsukahara, Taiji; Mikuriya, Takashi; Watanabe, Hideki; and Katada, Katsutoshi, to Kawasaki Steel Corporation. Method of plate rolling and equipment therefor. 4,392,371, Cl. 72-231.000.

Okuna, Kenji: *See*—
Nakajima, Isao; Tagusari, Koji; Okuna, Kenji; Hayama, Toru; Takahashi, Kazue; Watanabe, Michihiro; and Kotani, Sumihisa, 4,392,423, Cl. 101-93.480.

Okuyama, Ajoshio: *See*—
Takasugi, Mitsuo; and Okuyama, Ajoshio, 4,392,491, Cl. 604-202.000.

Olejak, Gerhard: *See*—
Bruggendieck, Siegfried; Nolting, Karl-Heinz; Krahn, Friedrich; and Olejak, Gerhard, 4,392,714, Cl. 350-96.230.

Olsen, John H.; and Pritchard, Robert S., to Flow Industries, Inc. High-pressure seal with controlled deflection under pressure. 4,392,655, Cl. 277-1.000.

Olson, Allan R.: *See*—
Spradlin, Joseph E.; Morgan, Jeffrey D.; Olson, Allan R.; and Howley, Joseph P., 4,393,085, Cl. 426-28.000.

Olson, Donald O. Self-perforating drip irrigation device. 4,392,616, Cl. 239-271.000.

Olympus Optical Company Limited: *See*—
Iwasama, Teruo; and Tojiki, Hitomi, 4,393,340, Cl. 318-301.000.
Kimura, Kenji, 4,392,726, Cl. 354-25.000.
Kimura, Kenji, 4,393,339, Cl. 318-254.000.
Kimura, Kenji, 4,393,409, Cl. 358-227.000.
Kimura, Kenji, 4,393,418, Cl. 360-22.000.
Nishikawa, Masaji, 4,392,737, Cl. 355-3.00R.
Sakurai, Yoshifumi, 4,393,427, Cl. 360-112.000.
Shimizu, Tsutomu, 4,392,716, Cl. 350-145.000.
Tomizawa, Yoshio, 4,393,420, Cl. 360-73.000.
Tsunefuji, Katsuhiko, 4,392,729, Cl. 354-152.000.

O'Mara, Raymond D.; Smorol, Michael E.; and Tobin, Curtis L., to Carrier Corporation. Apparatus for securing a wire to a grille. 4,392,525, Cl. 165-125.000.

Omori, Toshiyuki; and Abe, Kunihiro, to Kao Soap Co. Ltd. Screen filter. 4,392,951, Cl. 209-307.000.

Omura, Sadafumi: *See*—
Sawada, Jiro; Hanada, Kazunori; Tamai, Masaharu; Morimoto, Shigeo; and Omura, Sadafumi, 4,393,228, Cl. 549-549.000.

O'Neill, Michael H. Shade shirt. 4,392,258, Cl. 2-209.100.

Ong, Edith C.: *See*—
Barker, Robert A.; and Ong, Edith C., 4,392,298, Cl. 29-577.00C.

Ong, Warren R., to Fairchild Camera & Instrument Corp. Random access memory dual word line recovery circuitry. 4,393,476, Cl. 365-203.000.

Ono, Hironobu: *See*—
Miyagi, Hideo; Suematsu, Toshio; Nakano, Jiro; and Ono, Hironobu, 4,392,467, Cl. 123-325.000.

Onodera, Masahiro: *See*—
Makabe, Osamu; Murai, Yasushi; Okonogi, Tuneo; Onodera, Masahiro; Koyama, Yoshiyuki; and Yoshida, Takashi, 4,393,058, Cl. 424-246.000.

Op Het Veld, Adriaan J. G.: *See*—
Engelfriet, Adrianus R. C.; Op Het Veld, Adriaan J. G.; and Van Vucht, Theodorus J. P., 4,392,397, Cl. 76-107.00A.

Oreopoulos, Dimitrios G.; and Zellerman, Gabor. Catheter. 4,392,855, Cl. 604-175.000.

Orthoband Company, Inc.: *See*—
DeWoskin, Irvin S., 4,392,825, Cl. 433-5.000.

Osaka Municipal Government: *See*—
Hirashima, Tsuneaki; Miyata, Toshiyuki; Yamamoto, Yoshikazu; and Kato, Mitsuyuki, 4,393,216, Cl. 548-305.000.

Osche, Gregory R.: *See*—
Buser, Rudolph G.; Osche, Gregory R.; Nomiyama, Neal T.; and Rohde, Robert S., 4,393,517, Cl. 455-608.000.

Oshima, Harumi, to Tokico Ltd. Disc brake having slidably mounted caliper with friction pad supporting member provided thereon. 4,392,559, Cl. 188-73.320.

Otaki, Keiji: *See*—
Okuma, Kiwamu; Haga, Tsunehiro; Kizara, Masao; Otaki, Keiji; and Hirai, Ayahiro, 4,392,878, Cl. 65-6.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shirai, Takashi, 4,392,923, Cl. 204-59.00R.

Ott, Karl-Heinz: *See*—
Lindner, Christian; Ott, Karl-Heinz; and Pischtschan, Alfred, 4,393,172, Cl. 525-310.000.

Ottolini, Leonardo, to Luigi Franchi S.p.A. Safety device for the trigger mechanism of a shot-gun of the gas-pump type. 4,392,319, Cl. 42-69.00B.

Ouchi, Hiromu; Nishida, Masamitsu; and Numata, Kazunori, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramics. 4,392,970, Cl. 252-62.900.

Ouchi, Kiyoshi: *See*—
Shibata, Tomoyuki; Nakayama, Mituhito; and Ouchi, Kiyoshi, 4,392,790, Cl. 417-360.000.

Oude Alink, Bernardus A.: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,393,026, Cl. 422-12.000.

Outlaw, Benjamin T.: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,393,026, Cl. 422-12.000.

Outokumpu Oy: *See*—
Heimala, Seppo O.; Hultholm, Stig E.; and Tuovinen, Frans H., 4,393,029, Cl. 423-55.000.
Lilja, Launo L.; and Makitalo, Valto J., 4,392,885, Cl. 75-26.000.

Oval Engineering Co., Ltd.: *See*—
Okuda, Kuniteru; Fukami, Teruki; Asayama, Yoshiaki; Wada, Shunichi; and Kabuto, Masami, 4,392,385, Cl. 73-861.230.

Owen, Leonard J.: *See*—
Baker, Robert W.; Owen, Leonard J.; and Simmons, Reginald J., 4,392,706, Cl. 339-91.00R.

Owen, William H.; Simko, Richard T.; and Tchon, Wallace E., to Xicor, Inc. Nonvolatile static random access memory system. 4,393,481, Cl. 365-228.000.

Owens-Corning Fiberglas Corporation: *See*—
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,392,310, Cl. 34-172.000.
Takeuchi, Kunthiko; and Belt, James S., 4,392,879, Cl. 65-6.000.

Owens-Illinois, Inc.: *See*—
Uhlig, Albert R.; and Chang, Long F., 4,392,579, Cl. 215-253.000.

Oxenrider, Bryce C.: *See*—
Rogic, Milorad M.; and Oxenrider, Bryce C., 4,393,215, Cl. 548-125.000.

Ozawa, Kiyomi; and Ishii, Shigeru, to Nissan Chemical Industries, Ltd. Process for producing 6-phenoxypicolinic aldehydes. 4,393,213, Cl. 546-298.000.

Ozeki, Takeshi, to Tokyo Shibaura Electric Co., Ltd. Light distributor. 4,392,712, Cl. 350-96.160.

Pacific Nuclear Fuels, Inc.: *See*—
Lang, Linton W.; and Stetson, Robert L., 4,393,510, Cl. 376-172.000.

Paetsch, Juergen: *See*—
Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, 4,393,251, Cl. 568-811.000.

Painter, James D. Hosiery trimming apparatus. 4,392,596, Cl. 223-43.000.

Pako Corporation: *See*—
Anderson, Richard D., 4,392,743, Cl. 355-75.000.

Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,392,884, Cl. 71-100.000.

Palluel, Pierre: *See*—
Shroff, Arvind; and Palluel, Pierre, 4,393,328, Cl. 313-346.00R.

Palma, Gary E.: *See*—
Angelbeck, Albert W.; and Palma, Gary E., 4,393,503, Cl. 372-20.000.

Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, to Chinoin Gyogyszer Es

Vegyeszeti Termekek Gyara Rt. 2-Cyano-2-(3-phenoxy-phenyl)-propionic acid amide and preparation thereof. 4,393,008, Cl. 260-465.00D.
Pampalone, Thomas R., to RCA Corporation. Aqueous developable poly(olefin sulfone) terpolymers. 4,393,160, Cl. 524-360.000.
Paper Converting Machine Company: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., 4,392,844, Cl. 493-399.000.
Pardes, Greg: *See*—
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,392,576, Cl. 215-1.00C.
Parker, Alan; Farnhill, William M.; and Clough, Douglas O. Friction spinning apparatus. 4,392,343, Cl. 57-401.000.
Parrish, Reuel C. Quick disconnect safety coupling. 4,392,513, Cl. 137-614.010.
Parsons, Raymond L.: *See*—
Huntley, John D.; and Parsons, Raymond L., 4,393,459, Cl. 364-900.000.
Partridge, Joshua. Drain pan for radiators and cooling systems. 4,392,552, Cl. 184-106.000.
Pascarella, Vincent J.: *See*—
Damico, Dennis J.; and Pascarella, Vincent J., 4,393,186, Cl. 528-49.000.
Paschke, Edward E.; and Petty-Weeks, C. Bruce, to Standard Oil Company (Indiana). Polyamides and copolyamides comprising -1,2-di(p-aminophenoxy) ethane moieties. 4,393,162, Cl. 524-606.000.
Pascoe, Robert D., to American Standard Inc. Vital protection arrangement for railroad track circuits. 4,392,626, Cl. 246-34.00R.
Passavant-Werke Michelbacher Huette: *See*—
Fechter, Leonhard; and Jung, Hubert, 4,392,952, Cl. 210-159.000.
Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See*—
Dobrusskin, Alexander; Klein, Lutz; and Woizan, Gunter, 4,393,331, Cl. 313-489.000.
Paton, Samuel J.: *See*—
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Patsch, Manfred; Ruske, Manfred; and Hahn, Erwin, to BASF Aktiengesellschaft. Cationic phthalocyanine dyes. 4,393,005, Cl. 260-245.730.
Paul, Charles T.: *See*—
Ganzi, Gary C.; and Paul, Charles T., 4,392,958, Cl. 210-493.200.
Paulson, Robert C. Swabbing cup construction for swabbing an oil well pipe. 4,392,528, Cl. 166-153.000.
Paulson, Wayne M.; and Hughes, David W., to Motorola, Inc. Chromium-silicon-nitrogen resistor material. 4,392,992, Cl. 252-512.000.
Paulussen, Heinz: *See*—
Anstotz, Helmut; Kubik, Klaus; and Paulussen, Heinz, 4,392,288, Cl. 29-116.0AD.
Pawelchak, John M.; Chen, James L.; Cryan, John G.; and LaVia, Anthony L., to E. R. Squibb & Sons, Inc. Adhesive compositions. 4,393,080, Cl. 428-355.000.
Pearson, David D.; Lemkey, Frank D.; and Kear, Bernard H., to United Technologies Corporation. Superalloy properties through stress modified gamma prime morphology. 4,392,894, Cl. 148-2.000.
Pechau, Gerhard: *See*—
Wyzgol, Ewald; Rasehorn, Hans-Jurgen; and Pechau, Gerhard, 4,392,399, Cl. 83-106.000.
Pechiney Ugine Kuhlmann: *See*—
Armand, Marcel, 4,392,924, Cl. 204-64.00T.
Peck, Anthony W., to Burroughs Wellcome Co. Bupropion and ethanol. 4,393,078, Cl. 424-330.000.
Peck, John H.: *See*—
LaFever, Clifford E.; and Peck, John H., 4,392,407, Cl. 89-33.0BB.
Pelosi, Stanford S., Jr., to Norwich Eaton Pharmaceuticals, Inc. 3-[[5-(4-Chlorophenyl)furfurylidene]amino]-5-(substituted)-2-oxazolidinones. 4,393,204, Cl. 542-420.000.
Penco, Sergio: *See*—
Bargiotti, Alberto; Cassinelli, Giuseppe; Penco, Sergio; Arcamone, Federico; and Casazza, Annamaria, 4,393,052, Cl. 424-180.000.
Pendlebury, David: *See*—
Stables, Wilbur L.; Pendlebury, David; Saich, Anthony M.; and Hamlyn, Maxwell C., 4,392,285, Cl. 28-276.000.
Pennwalt Corporation: *See*—
Kamens, Ernest R., 4,393,148, Cl. 521-93.000.
Sandler, Stanley R.; and Bohen, Joseph M., 4,393,248, Cl. 568-676.000.
Sprout, Oliver S., Jr., 4,393,093, Cl. 427-40.000.
Pennzoil Company: *See*—
Drechsel, Erhart K.; Holcomb, Dysart E.; and Sardisco, John B., 4,393,032, Cl. 423-320.000.
Sardisco, John B.; and Holcomb, Dysart E., 4,393,030, Cl. 423-167.000.
Perisic, Milan; Lumbers, Warwick J.; and Bone, John A., to Automatic Rollers Doors Australia Pty., Ltd. Electrically-operated roller door operating mechanism. 4,392,392, Cl. 74-626.000.
Perkin-Elmer Corporation, The: *See*—
Volpe, Gerald T.; Laskoski, Leonard S.; Amodeo, Ralph J.; Swanson, William J.; and Gottesman, Jerome D., 4,393,352, Cl. 329-50.000.
Perkins, David, Jr., to Corrugated Drum Systems, Inc. Carton with integral closures. 4,392,607, Cl. 229-39.00R.
Perl, Horst; Nussbaumer, Dietmar; Kluver, Horst; and Beer, Hans, to Sartorius GmbH. Resorcinol or phloroglucinol condensation product for aqueous mixture purification. 4,392,963, Cl. 210-692.000.
Permawick Bearing Corporation: *See*—
Abel, Martin L., 4,392,753, Cl. 384-136.000.
Pernicano, Vincent S.; and Wright, Michael R. Reflective garment and method of manufacturing same. 4,392,901, Cl. 156-155.000.
Peters, Daniel G.: *See*—
Holtey, Thomas O.; Noyes, Steven S.; and Peters, Daniel G., 4,393,461, Cl. 364-900.000.
Peters, Karl-Clemens: *See*—
Hummerich, Rainer; Weiss, Wolfram; Merger, Franz; Immel, Guenther; Kraus, Hans-Joachim; and Peters, Karl-Clemens, 4,393,207, Cl. 544-196.000.
Peters, Roswell D. M., to United States of America, Army. Quartz resonator processing system. 4,392,287, Cl. 29-25.350.
Petersen, Uwe: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; and Zeiler, Hans-Joachim, 4,393,051, Cl. 424-180.000.
Peterson, Edward W.: *See*—
Lagus, Peter L.; Peterson, Edward W.; and Hicks, William O., 4,392,376, Cl. 73-155.000.
Peterson, Terry M., to Chevron Research Company. Method for improving the efficiency of a solar cell and an improved cadmium sulfide/copper sulfide photovoltaic cell. 4,393,267, Cl. 136-260.000.
Petre, John H.; and Cosgrove, Delos M., to Cleveland Clinic Foundation, The. Infusion pump controller. 4,392,849, Cl. 604-66.000.
Petrina, Robert J., to Bruce Industries, Inc. Repairable fluorescent lamp ballast. 4,393,435, Cl. 361-377.000.
Petrolite Corporation: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,393,026, Cl. 422-12.000.
Petty-Weeks, C. Bruce: *See*—
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Pfizer Inc.: *See*—
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Phillips, Bobby M., to Eastman Kodak Company. Spinneret orifice cross-sections. 4,392,808, Cl. 425-464.000.
Phillips Petroleum Company: *See*—
Edmonds, James T., Jr., 4,393,197, Cl. 528-388.000.
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Witt, Donald R., 4,392,990, Cl. 252-458.000.
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Yokogawa, Tomoshisa; and Gomi, Shintaro, 4,393,513, Cl. 455-243.000.
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Pitches, Brian E.; Murray, Robert M. S.; and Rogers, Douglas J., to 501 Ferranti Limited. Capacitance measuring apparatus. 4,392,378, Cl. 73-304.00C.
Piter, Hans; and Serapins, Klaus, to Felten & Guilleaume Carlswerk AG. Arrangement for alignedly coupling two coated light-conductive fibers. 4,392,713, Cl. 350-96.210.
Pithouse, Kenneth B.; and Swinnurn, Christopher J., to Raychem Limited. Device for enclosing objects. 4,392,898, Cl. 156-85.000.
Pitney Bowes Inc.: *See*—
Couper, Robert A.; Frediani, John K.; and Lillie, Terrance L., 4,393,377, Cl. 340-731.000.
Di Giulio, Peter C., 4,393,386, Cl. 346-75.000.
Soderberg, John H., 4,393,454, Cl. 364-518.000.
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Schurman, Peter T., 4,393,023, Cl. 264-150.000.
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Culley, Ernest, 4,393,490, Cl. 370-13.000.
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Potter, Ralph M., to General Electric Company. Method of coating a fused silica envelope. 4,393,100, Cl. 427-181.000.
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Prem Magnetics, Inc.: *See—*
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Pushee, Joan C.; Harry, Ieuan L.; Beck, Martin H.; and Krishnakumar, Suppayan M., to Continental Group, Inc., The. Solid stating. 4,392,804, Cl. 425-174.80E.
Q-Dot, Inc.: *See—*
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Ramdohr, Detlef; Knauf, Walter; Brensing, Karl-Heinz; and Kummerling, Rolf, to Mannesmann Aktiengesellschaft. Diagonal rolling of hollow stock. 4,392,369, Cl. 72-96.000.
Ramer, Paul C., to Alpine Research, Inc. Integral ski binding. 4,392,666, Cl. 280-614.000.
Rankin, E. Edward, to Gearhart Industries, Inc. Early gas detection system for a drill stem test. 4,392,377, Cl. 73-155.000.
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RCA Corporation: *See—*
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Reed, Charles F.; and Morrow, Charles M., to Avery International Corporation. Star trip label stripper. 4,392,585, Cl. 221-1.000.
Reed, Russell, Jr.; Burdette, George W.; Meyers, Gary W.; and Vuono, William R., to United States of America, Navy. Ramjet fuel. 4,392,895, Cl. 149-19.300.
Reeves, Jerry L., to Towmotor Corporation. Load lifting carriage having side shift adjustable forks. 4,392,772, Cl. 414-667.000.
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Reimschuessel, Herbert K.; and DeBona, Bruce T., to Allied Corporation. Preparation of p-(1,1-dimethyl-2-hydroxyethyl)benzoic acid. 4,393,233, Cl. 562-473.000.
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Reischl, Artur; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for the preparation of polyaddition products of isocyanates and denatured biomasses, their use as reactive fillers and as plant nutrients and a process for the production of sheets or shaped articles using the polyaddition products. 4,393,166, Cl. 525-27.000.
Reitmeier, Glenn A., to RCA Corporation. Horizontal-rate phase-change of TV pixel distribution among multiple recorder tracks for dropout concealment. 4,393,414, Cl. 358-336.000.
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Ridge, Warren J.; and Roberts, Dennis C., to Wespac. Multiple camera automatic digitizer and method. 4,393,410, Cl. 358-285.000.
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, to Bayer Aktiengesellschaft. N-N-Bis(haloacyl)-diaza-cycloalkanes for protecting plants from herbicide damage. 4,392,882, Cl. 71-92.000.
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, to Chemische Werke Huls AG. Fire retardant fine particulate expandable styrene polymers. 4,393,146, Cl. 521-56.000.
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Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, 4,393,282, Cl. 200-19.00R.
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Rogers, George L. Lineal multi-cylinder hydraulic pumping unit for wells. 4,392,792, Cl. 417-400.000.
Rogers, Howard G.; Gaudiana, Russell A.; Mancilo, Jeannette S.; and Sahatjian, Ronald A., to Polaroid Corporation. Polymers containing recurring units from dienoic acid. 4,393,196, Cl. 528-363.000.
Rogers, Philip J., to Pilkington P. E. Limited. Optical apparatus. 4,392,710, Cl. 350-505.000.
Rogic, Milorad M.; and Oxenrider, Bryce C., to Allied Corporation. Cleavage of dialkoxyketoxime. 4,393,215, Cl. 548-125.000.
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Roper Corporation: *See*—
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Rotondo, Richard. Rocker arm adapter for altering cam profile of exhaust valve. 4,392,461, Cl. 123-90.160.
Roueche, Armand: *See*—
Muller, Rolf; Roueche, Armand; Muller, Paul; and Ronco, Karl, 4,392,999, Cl. 260-157.000.
Rowe International, Inc.: *See*—
Scalera, Frank T., 4,392,588, Cl. 222-129.400.

Royer, Daniel: *See*—
Guedj, Richard; Dieulesaint, Eugene; and Royer, Daniel, 4,393,268, Cl. 178-18.000.

Rubik, Erno, to Politoys Ipari Szovetkezet. Toy with turnable elements for forming geometric shapes. 4,392,323, Cl. 46-1.00R.

Rudolf, Susan A.: *See*—
Rudolf, Warren P.; and Rudolf, Susan A., 4,392,311, Cl. 36-7.300.

Rudolf, Warren P.; and Rudolf, Susan A. Expandable overshoe. 4,392,311, Cl. 36-7.300.

Ruedin, Yves: *See*—
Ganguillet, Claude; Ruedin, Yves; and Sallin, Michel, 4,392,720, Cl. 350-357.000.

Ruf, Max, to Audi NSU Auto Union Aktiengesellschaft. Device for lubricating a rotary piston air pump. 4,392,797, Cl. 418-91.000.

Ruf, Walter: *See*—
Neuhaus, Dieter; Sohner, Gerhard; Ruf, Walter; Jesse, Erich; and Roth, Helmut, 4,393,432, Cl. 361-104.000.

Rufford, Roger V., to Fairchild Camera & Instrument Corp. Random access memory preset circuitry. 4,393,473, Cl. 365-190.000.

Rule Industries, Inc.: *See*—
Muessel, Dan C.; and Hagopian, Nubar, 4,392,635, Cl. 254-344.000.

Runge, Richard J.: *See*—
Thompson, Don D.; Brown, Robert J. S.; and Runge, Richard J., 4,393,486, Cl. 367-73.000.

Ruske, Manfred: *See*—
Patsch, Manfred; Ruske, Manfred; and Hahn, Erwin, 4,393,005, Cl. 260-245.730.

Russell, B. Carson. Drawer building system having fastening guns. 4,392,599, Cl. 227-40.000.

Russey, James W., to Towmotor Corporation. Lift mast assembly. 4,392,554, Cl. 187-9.00E.

Ryco Graphic Manufacturing, Inc.: *See*—
Switall, Thomas G., 4,392,508, Cl. 137-99.000.

S-Cubed: *See*—
Lagus, Peter L.; Peterson, Edward W.; and Hicks, William O., 4,392,376, Cl. 73-155.000.

S R I International: *See*—
Manser, Gerald E., 4,393,199, Cl. 528-408.000.

Saab-Scania Aktiebolag: *See*—
Folkesson, Hans; and Uberg, Ulf, 4,392,368, Cl. 72-63.000.

Safdy, Max E.: *See*—
Schut, Robert N.; Safdy, Max E.; and Hong, Enrique, 4,393,081, Cl. 424-274.000.

Sagae, Syoji: *See*—
Matsuda, Yasumasa; Mukumoto, Kyoji; Sagae, Syoji; and Kasahara, Masatoshi, 4,393,388, Cl. 346-140.00R.

Sagami Chemical Research Center: *See*—
Ichikawa, Masaru, 4,393,144, Cl. 518-715.000.

Sagishima, Takayuki: *See*—
Ikushima, Hiroshi; Baba, Takaaki; Sagishima, Takayuki; and Tanaka, Masanobu, 4,393,400, Cl. 358-92.000.

Sahara, Masayoshi; Nakai, Masaaki; Ishida, Tokuji; and Hosomizu, Hiroshi, to Minolta Camera Kabushiki Kaisha. Camera exposure control devices with smoothing circuit. 4,392,727, Cl. 354-43.000.

Sahatjian, Ronald A.: *See*—
Rogers, Howard G.; Gaudiana, Russell A.; Manello, Jeannette S.; and Sahatjian, Ronald A., 4,393,196, Cl. 528-363.000.

Saich, Anthony M.: *See*—
Stables, Wilbur L.; Pendlebury, David; Saich, Anthony M.; and Hamlyn, Maxwell C., 4,392,285, Cl. 28-276.000.

Saint-Gobain Vitrage: *See*—
Schwarzenberg, Norbert; Ueberwolf, Heinz; and Kaesmacher, Jakob, 4,392,404, Cl. 83-886.000.

Saito, Junichi; and Kume, Toyohiko, to Nihon Tokushu Noyaku Seizo K.K. Preparation of bis-(1-bromo-2,3,3-trichloro-2-propenyl) ether. 4,392,929, Cl. 204-158.0HA.

Saito, Norio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,392,923, Cl. 204-59.00R.

Saito, Shigemasa, to Fuji Electric Company, Ltd. Method of manufacturing a movable contact member. 4,392,302, Cl. 29-879.000.

Saito, Yoshitada: *See*—
Yano, Akira; Saito, Yoshitada; and Kasahara, Yasushi, 4,393,134, Cl. 435-29.000.

Sakakibara Sangyo Kabushiki Kaisha: *See*—
Sakakibara, Syoji, 4,392,896, Cl. 156-39.000.

Sakakibara, Syoji, to Sakakibara Sangyo Kabushiki Kaisha. Method of producing a gypsum plaster board. 4,392,896, Cl. 156-39.000.

Sakamaki, Hisashi: *See*—
Inuzuka, Tsuneki; Murakami, Koichi; Kurita, Kenji; and Sakamaki, Hisashi, 4,392,741, Cl. 355-14.00R.

Sakano, Kozaburo: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; Hirata, Sadao; Yazaki, Jinichi; and Sakano, Kozaburo, 4,393,106, Cl. 428-35.000.

Sakcriska, Glenn, to Canadian Skate Contours, Ltd. Ice skate sharpener. 4,392,332, Cl. 51-92.0BS.

Sakudo, Noriyuki; Tokiquchi, Katsumi; Koike, Hideni; Kanomata, Ichiro; and Nakashima, Humihiko, to Hitachi, Ltd. Microwave plasma ion source. 4,393,333, Cl. 315-111.810.

Sakurai, Yoshifumi, to Olympus Optical Co., Ltd. Multichannel magnetic head. 4,393,427, Cl. 360-112.000.

Salk Institute for Biological Studies, The: *See*—
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,393,050, Cl. 424-177.000.

Sallin, Michel: *See*—
Ganguillet, Claude; Ruedin, Yves; and Sallin, Michel, 4,392,720, Cl. 350-357.000.

Salzman, Norman; and Wellner, Edward. Body coordination training aid. 4,392,830, Cl. 434-258.000.

Sanders, Bernard, to Bonar Horticulture, Ltd. Plant growing unit, method and system. 4,392,327, Cl. 47-59.000.

Sandler, Stanley R.; and Bohen, Joseph M., to Pennwalt Corporation. Flame retarded halogenated polyol. 4,393,248, Cl. 568-676.000.

Sano, Kazuhiko: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.

Sano, Yasuro, to Janome Sewing Machine Co., Ltd. Sewing machine with a cyclic pattern stitching device. 4,392,442, Cl. 112-275.000.

Sapp, John B., Jr.: *See*—
Hanson, Harry T.; and Sapp, John B., Jr., 4,393,241, Cl. 568-49.000.

Sardisco, John B.; and Holcomb, Dysart E., to Pennzoil Company. Upgrading of phosphate ore. 4,393,030, Cl. 423-167.000.

Sardisco, John B.: *See*—
Drechsel, Erhart K.; Holcomb, Dysart E.; and Sardisco, John B., 4,393,032, Cl. 423-320.000.

Sartorius GmbH: *See*—
Perl, Horst; Nussbaumer, Dietmar; Kluver, Horst; and Beer, Hans, 4,392,963, Cl. 210-692.000.

Sasagawa, Masaru; Umeda, Tatsuo; and Kushima, Mamoru, to Honda Giken Kogyo Kabushiki Kaisha. Trimming and piercing apparatus. 4,392,400, Cl. 83-185.000.

Sasai, Mitsuo; Tomikawa, Kiyozi; and Kajiwara, Kazuo, to Nittetsu Steel Drum Co., Ltd. Method and apparatus for forming drum seam. 4,392,295, Cl. 29-509.000.

Sasaki, Takashi; Hagiwara, Miyuki; Hosoi, Fumio; and Takagi, Tohru, to Japan Atomic Energy Research Institute. Polymer compositions. 4,393,165, Cl. 525-10.000.

Sasano, Yoshiro: *See*—
Takeda, Koichi; and Sasano, Yoshiro, 4,393,449, Cl. 364-474.000.

Sasaoka, Michio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,392,923, Cl. 204-59.00R.

Sasaoka, Takeshi: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.

Sato, Hideki: *See*—
Itsubo, Junichi; Mori, Fumio; and Sato, Hideki, 4,392,581, Cl. 215-348.000.

Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, to Dainippon Mk & Chemicals Inc. 1-Cyclohexyl-2-cyclohexylphenylethane derivatives. 4,393,258, Cl. 585-25.000.

Sato, Koichiro: *See*—
Fujii, Kunihiko; Hirosaki, Yukihiro; Nishiyama, Yoshihisa; and Sato, Koichiro, 4,392,535, Cl. 177-1.000.

Sato, Kokichi: *See*—
Maekawa, Hideyuki; Hiramoto, Shinji; Itaya, Kozo; Sato, Kokichi; and Nishida, Hirotaka, 4,392,577, Cl. 215-32.000.

Sato, Nobukatsu: *See*—
Inoue, Koji; Sato, Nobukatsu; and Tamura, Takashi, 4,393,219, Cl. 548-534.000.

Sato, Yoshinari; and Teraji, Tsutomu, to Fujisawa Pharmaceutical Co., Ltd. Dihydropyridine derivative, and pharmaceutical composition comprising the same. 4,393,070, Cl. 424-266.000.

Sato, Yoshito; and Takahashi, Tomoyuki, to Kabushiki Kaisha Komatsu Seisakusho. Final drive assembly for vehicles. 4,392,396, Cl. 74-785.000.

Sauer, Philip H.: *See*—
Huck, Charles M.; Studer, John E.; and Sauer, Philip H., 4,392,860, Cl. 604-212.000.

Saurer-Allma GmbH: *See*—
Grill, Werner, 4,392,341, Cl. 57-90.000.

Savin Corporation: *See*—
Landa, Benzion, 4,392,742, Cl. 355-15.000.

Sawada, Jiro; Hanada, Kazunori; Tamai, Masaharu; Morimoto, Shigeo; and Omura, Sadafumi, to Taisho Pharmaceutical Co., Ltd. Epoxysuccinic acid derivatives. 4,393,228, Cl. 549-549.000.

Scalera, Frank T., to Rowe International, Inc. Nozzle assembly for cold drink merchandiser. 4,392,588, Cl. 222-129.400.

Scansaroli, Michael N.: *See*—
Whalin, Jeffery A.; Shanley, Charles W.; Scansaroli, Michael N.; and Dworsky, Lawrence N., 4,393,131, Cl. 430-320.000.

Schadlich, Gunther: *See*—
Moraw, Roland; and Schadlich, Gunther, 4,392,711, Cl. 350-361.000.

Schalch, Eugen: *See*—
Alder, Hanspeter; and Schalch, Eugen, 4,392,925, Cl. 204-67.000.

Scharf, William D.: *See*—
Merkel, George; and Scharf, William D., 4,393,509, Cl. 376-156.000.

Schelhorn, Robert L., to RCA Corporation. Porcelain coated metal boards having interconnections between the face and reverse surfaces thereof. 4,393,438, Cl. 361-401.000.

Schelling & Co.: *See*—
Esa, Wilfried, 4,392,401, Cl. 83-219.000.

Schenk, Gunther; Bergthaller, Peter; Wolfrum, Gerhard; and Stolzenburg, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Photographic

recording material with arylazocyanoacetic ester dye releasers. 4,393,132, Cl. 430-562.000.
Schepotin, Sergei G.: *See*—
Glebov, Vladimir P.; Krivtsov, Georgy V.; Danchenkov, Jury V.; Khukhry, Sergei A.; and Schepotin, Sergei G., 4,392,567, Cl. 198-544.000.
Scherler, Alfred: *See*—
Bertschinger, Hans; and Scherler, Alfred, 4,392,954, Cl. 210-195.300.
Scheuermann, Rolf: *See*—
Leifeld, Ferdinand; Marx, Hans-Jurgen; and Scheuermann, Rolf, 4,392,275, Cl. 19-81.000.
Schiek, James M.: *See*—
Bloemers, James L.; Schiek, James M.; Frazzell, Michael E.; and Karls, Michael A., 4,392,779, Cl. 415-141.000.
Schimitzek, Gunter; and Reiche, Horst. Clampable apparatus for grinding spherical surfaces. 4,392,331, Cl. 51-55.000.
Schlicht, Raymond C., to Texaco Inc. Molybdenum-zinc dialkyldithiophosphates as lubricant additives. 4,392,966, Cl. 252-32.70E.
Schloemann-Siemag Aktiengesellschaft: *See*—
Bald, Wilfried, 4,392,367, Cl. 72-12.000.
Schlueter, Gert; and Schuster, Wilhelm, to Battelle-Institut e.V. Method and device for examining urine for particulate constituents. 4,393,141, Cl. 436-63.000.
Schmatz, Jurgen: *See*—
Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, 4,393,282, Cl. 200-19.00R.
Schmid, Gerhard E.: *See*—
Greschner, Johann; Kraus, Georg; and Schmid, Gerhard E., 4,393,127, Cl. 430-5.000.
Schmidt, Edward M.; and Kahl, George D., to United States of America, Army. Gaseous blast reducer. 4,392,412, Cl. 89-14.00D.
Schmidt, Johan M.: *See*—
Claasen, Theodoor A. C. M.; Gielis, Gerardus C. M.; Schmidt, Johan M.; and Schoonheijm, Harry B., 4,393,273, Cl. 179-1.0GD.
Schmidt, Klaus, to Carl Freudenberg, Firma. Filter packing. 4,392,876, Cl. 55-524.000.
Schmidt, Robert J., to UOP Inc. Hydration of olefins. 4,393,256, Cl. 568-907.000.
Schmidt, Terrance C., to Electrohome Limited. Regulation of the EHT voltage of a CRT. 4,393,336, Cl. 315-387.000.
Schmitt, Helmut; Strewe, Wolfgang; and Schurig, Helmuth, to Uhde GmbH. Electrolysis cell. 4,392,937, Cl. 204-269.000.
Schnurle, Hans: *See*—
Gunther, Dieter; Bertsch, Richard; Bottcher, Siegfried; Arnold, Herbert; Schnurle, Hans; and Horbelt, Michael, 4,392,470, Cl. 123-440.000.
Schoen, David A.: *See*—
Jackson, Tee-Squant-Nee; Vernon, Paul M.; and Schoen, David A., 4,393,498, Cl. 371-20.000.
Scholz, Romanus: *See*—
Hofbauer, Peter; Scholz, Romanus; Heidemeyer, Paulus; and Zimmermann, Frank, 4,392,394, Cl. 74-689.000.
Schoonheijm, Harry B.: *See*—
Claasen, Theodoor A. C. M.; Gielis, Gerardus C. M.; Schmidt, Johan M.; and Schoonheijm, Harry B., 4,393,273, Cl. 179-1.0GD.
Schopper, Bernd, to ITT Industries, Inc. Pressure regulator. 4,392,511, Cl. 137-493.200.
Schopper, Bernd; Lowe, Derek; Reinartz, Hans-Dieter; and Tandler, Peter, to ITT Industries, Inc. Dual-circuit pressure control valves. 4,392,691, Cl. 303-6.00C.
Schrader, Alfons; and Schreiner, Waldemar, to Babcock Textilmaschinen GmbH. Apparatus for heat treating a continuously moving web. 4,392,309, Cl. 34-54.000.
Schreiner, Gary W.; Kemp, Merle L., *Jr.*; and Chernoff, Edward A., to Products Unlimited Corp. Electromagnetic relay. 4,393,359, Cl. 335-128.000.
Schreiner, Waldemar: *See*—
Schrader, Alfons; and Schreiner, Waldemar, 4,392,309, Cl. 34-54.000.
Schrenk, Jurgen; and Wunderwald, Peter, to Boehringer Mannheim GmbH. Process for the selective separation of endoproteases. 4,393,139, Cl. 435-219.000.
Schrotz, Kurt; and Schwobel, Richard, to Esselte Pendaflex Corporation. Belt printing mechanism having improved catch mechanism for detenting positioning wheel. 4,392,424, Cl. 101-111.000
Schubert, Fritz. Orrery. 4,392,831, Cl. 434-291.000.
Schuck, Lee R.: *See*—
Calkins, James D.; Bushong, Eugene E.; and Schuck, Lee R., 4,393,313, Cl. 250-560.000.
Schultz, Donald L., to Clark Equipment Company. Pivoted steering column for lift truck. 4,392,670, Cl. 280-775.000.
Schulz, Walther: *See*—
Wagner, Fritz; Lindorfer, Walter; Jahn-Held, Wilhelm; and Schulz, Walther, 4,392,892, Cl. 134-25.100.
Schumacher, Bernd: *See*—
Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, 4,393,282, Cl. 200-19.00R.
Schumacher, Ralf: *See*—
Struck, Carl-Heinz; and Schumacher, Ralf, 4,392,824, Cl. 432-180.000.
Schumann, Klaus: *See*—
Altenschopfer, Theodor; and Schumann, Klaus, 4,392,977, Cl. 252-174.190.
Schuning, George F.: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., 4,392,844, Cl. 493-399.000.
Schurig, Helmuth: *See*—
Schmitt, Helmut; Strewe, Wolfgang; and Schurig, Helmuth, 4,392,937, Cl. 204-269.000.
Schurman, Peter T., to Plastic Forming Company, Inc., The. Method for preparing a parison and transferring it to a molding machine. 4,393,023, Cl. 264-150.000.
Schuster, Wilhelm: *See*—
Schlueter, Gert; and Schuster, Wilhelm, 4,393,141, Cl. 436-63.000.
Schut, Robert N.; Safdy, Max E.; and Hong, Enrique, to Miles Laboratories, Inc. Methyl 3-acetamido-2-(5-methoxy-indol-3-yl) propanoate and hypotensive use thereof. 4,393,081, Cl. 424-274.000.
Schutt, Hermann, to Bayer Aktiengesellschaft. Process for the preparation of the highly pure enzyme kallikrein from swine pancreas extracts. 4,393,140, Cl. 435-226.000.
Schwager, Frederic A., to Mattel, Inc. Self-locking two-part fastener. 4,392,279, Cl. 24-221.00R.
Schwartz, Alan R.: *See*—
Marshall, Harry L.; and Schwartz, Alan R., 4,393,118, Cl. 428-403.000.
Schwarz, Richard A., to Conden Technology, Inc. Expandable polymeric styrene particles. 4,393,147, Cl. 521-60.000.
Schwarzenbach, Alfred, to BBC Brown, Boveri & Company Limited. Constant pressure air storage installation with water supply for gas turbine power plants. 4,392,354, Cl. 60-727.000.
Schwarzenberg, Norbert; Ueberwolf, Heinz; and Kaesmacher, Jakob, to Saint-Gobain Vitrage. Cutting head for glass cutting machine. 4,392,404, Cl. 83-886.000.
Schwei, Lawrence J.: *See*—
Stinson, Wilbur G.; Schwei, Lawrence J.; and Vong, Sandy T. S., 4,393,098, Cl. 427-168.000.
Schwobel, Richard: *See*—
Schrotz, Kurt; and Schwobel, Richard, 4,392,424, Cl. 101-111.000.
Sears, Stanley L., to Boeing Company, The. Panel welding system. 4,392,604, Cl. 228-212.000.
Seeley, Elwin W.: *See*—
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,393,350, Cl. 324-334.000.
Seeney, Charles E.; Kraemer, John F.; and Varnum, Nancy C., to International Minerals & Chemicals Corp. Oxidatively coupled cold-set binders. 4,393,152, Cl. 523-139.000.
Seher, Eugen: *See*—
Kantz, Dieter; and Seher, Eugen, 4,393,478, Cl. 365-210.000.
Seiden, Lewis J., to T-Bar Incorporated. Transfer bus matrix. 4,393,381, Cl. 340-825.830.
Seino, Kazuyuki: *See*—
Takenaka, Shigeo; Kamohara, Eiji; and Seino, Kazuyuki, 4,392,914, Cl. 156-633.000.
Seirei Industry Company Limited: *See*—
Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, 4,392,421, Cl. 99-524.000.
Seitzer, Walter H.: *See*—
Roth, Robert B.; and Seitzer, Walter H., 4,392,941, Cl. 208-11.0LE.
Seiyaku Co., Ltd.: *See*—
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, 4,393,210, Cl. 546-141.000.
Sekigawa, Keiji, to Ricoh Co., Ltd. Method of reproducing a picture having improved resolution. 4,393,452, Cl. 364-514.000.
Sekimoto, Soh.ei, to Fuji Xerox Co., Ltd. Image forming method and apparatus. 4,392,719, Cl. 350-342.000.
Selectastation, Inc.: *See*—
Besen, Peter D.; Shulsinger, Don H.; and Goldberg, Stuart D., 4,393,277, Cl. 179-2.00A.
Selner, Allen J.; and Selner, Marc D. Method and apparatus for foot stabilization. 4,392,487, Cl. 128-80.00H.
Selner, Marc D.: *See*—
Selner, Allen J.; and Selner, Marc D., 4,392,487, Cl. 128-80.00H.
Seltzer, Raymond: *See*—
Weiss, Jonas; and Seltzer, Raymond, 4,393,002, Cl. 260-239.30R.
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, to Seiyaku Co., Ltd.; and Taiho Pharmaceutical Co., Ltd. 1(2H)-Isoquinolone compounds and acid addition salts thereof. 4,393,210, Cl. 546-141.000.
Seng, Stephen: *See*—
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,392,310, Cl. 34-172.000.
Sengenberger, Charles G.: *See*—
Corbeels, Roger J.; and Sengenberger, Charles G., 4,392,981, Cl. 252-373.000.
Sentoku, Hideshi, to Laurel Bank Machine Co., Ltd. Stacking cylinder for use in a coin handling machine. 4,392,504, Cl. 133-1.00A.
Sentrol, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,392,707, Cl. 339-125.00R.
Sepke, Arnold L., to National Union Electric Corporation. Electric vacuum cleaner with window for viewing belt. 4,392,271, Cl. 15-339.000.
Serapins, Klaus: *See*—
Piter, Hans; and Serapins, Klaus, 4,392,713, Cl. 350-96.210.
Shacter, Stuart B.: *See*—
Davis, William F.; and Shacter, Stuart B., 4,393,355, Cl. 330-294.000.

Shade, Ray W.: *See—*
Ritzer, Alan; Hajjar, Abraham L.; McEntee, Harry R.; and Shade, Ray W., 4,393,229, Cl. 556-430.000.

Shakespear, Horacio, to General Motors Corporation. Vehicle suspension system. 4,392,667, Cl. 280-690.000.

Shalit, Harold: *See—*
Sun, Hsiang-ning; Leonard, John J.; and Shalit, Harold, 4,393,038, Cl. 423-584.000.

Shanley, Charles W.: *See—*
Whalin, Jeffery A.; Shanley, Charles W.; Scansaroli, Michael N.; and Dworsky, Lawrence N., 4,393,131, Cl. 430-320.000.

Sharp Kabushiki Kaisha: *See—*
Masuzawa, Sigeaki; and Kihara, Yoshiro, 4,393,460, Cl. 364-900.000.
Tanimoto, Akira; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,393,462, Cl. 364-900.000.

Shaw, Joseph M., to RCA Corporation. Method of manufacturing low resistance gates and interconnections. 4,392,299, Cl. 29-590.000.

Sheingorn, Larry A. Device for blind spot delineation. 4,392,725, Cl. 351-224.000.

Shell Oil Company: *See—*
Allen, Roy A., 4,393,181, Cl. 525-504.000.
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,393,182, Cl. 526-125.000.

Sherman, Allan, to United States of America, National Aeronautics and Space Administration. Cooling by conversion of para to ortho-hydrogen. 4,393,039, Cl. 423-648.00R.

Sherwin-Williams Company, The: *See—*
Wagener, Anthony P., 4,392,994, Cl. 252-602.000.

Sherwood Medical Company: *See—*
George, Robert D.; and di Palma, Georgio, 4,392,858, Cl. 604-187.000.

Shiba, Keisuke; Nakao, Sho; and Toyama, Tadao, to Fuji Photo Film Co., Ltd. Light-sensitive lithographic printing plate precursor. 4,393,128, Cl. 430-273.000.

Shibata, Kazuhiko: *See—*
Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, 4,393,467, Cl. 364-424.100.

Shibata, Tomoyuki; Nakayama, Mituhito; and Ouchi, Kiyoshi, to Ebara Corporation. Coupling system for submergible pump. 4,392,790, Cl. 417-360.000.

Shibazaki, Kenji: *See—*
Ito, Masazumi; and Shibazaki, Kenji, 4,392,740, Cl. 355-14.0SH.
Sugiura, Masamichi; and Shibazaki, Kenji, 4,393,375, Cl. 340-700.000.

Shibukawa, Mitsuru: *See—*
Hayashi, Hiroshi; Shimojima, Yukiji; Shirai, Takashi; Ishida, Torao; and Shibukawa, Mitsuru, 4,393,225, Cl. 549-289.000.

Shibuya, Kyoichi; and Ihara, Tomomi, to Sumitomo Semento Kabushiki Kaisha. Method of recovering exhaust gas from boiler in electrical power generating device using combustible material as fuel and apparatus for performing such method. 4,392,353, Cl. 60-657.000.

Shibuya, Yoshimichi; and Takahashi, Masami, to Hitachi, Ltd. Liquid crystal display device. 4,392,717, Cl. 350-334.000.

Shikano, Michio; and Kitagawa, Shuzi, to Kabushiki Kaisha Fujikoshi. Internal gear pump motor. 4,392,799, Cl. 418-169.000.

Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Electron beam working apparatus for cylindrical members. 4,393,294, Cl. 219-121.0EC.

Shimada, Hiroshi; and Aoyama, Keizo, to Fujitsu Limited. Semiconductor memory circuit. 4,393,472, Cl. 365-190.000.

Shimada, Hiroshi, to Fujitsu Limited. Address buffer circuit. 4,393,480, Cl. 365-227.000.

Shimane, Koichi: *See—*
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.

Shimatsu, Minoru: *See—*
Yoshitsugu, Seikichi; and Shimatsu, Minoru, 4,392,684, Cl. 296-185.000.

Shimazaki, Kanzo: *See—*
Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, 4,392,421, Cl. 99-524.000.

Shimazu, Yoshimi: *See—*
Watanabe, Masazumi; Uehara, Mikio; Shimazu, Yoshimi; Ishiyama, Jiro; and Kato, Motohiko, 4,393,083, Cl. 426-15.000.

Shimizu, Masami; and Yasunobe, Junji, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Oil seal for bearings of turbocharger. 4,392,752, Cl. 384-135.000.

Shimizu, Masami; and Monno, Asao, to Fuji Electric Company, Ltd. Method of tube wall thickness measurement. 4,393,305, Cl. 250-358.100.

Shimizu, Tsutomu, to Olympus Optical Co., Ltd. Mechanism to maintain constant body tube length of binocular microscope. 4,392,716, Cl. 350-145.000.

Shimojima, Yukiji: *See—*
Hayashi, Hiroshi; Shimojima, Yukiji; Shirai, Takashi; Ishida, Torao; and Shibukawa, Mitsuru, 4,393,225, Cl. 549-289.000.

Shimoyama, Toshikazu: *See—*
Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, 4,393,294, Cl. 219-121.0EC.

Shimoyashiki, Nobuyoshi: *See—*
Akiyama, Hiroyuki; Hatakeyama, Hideo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,393,016, Cl. 264-53.000.

Shinohara, Koichi; and Fujita, Takashi, to Matsushita Electric Industrial Co., Ltd. Method of vacuum depositing a layer on a plastic film substrate. 4,393,091, Cl. 427-13.000.

Shionogi & Co., Ltd.: *See—*
Maekawa, Hideyuki; Hiramoto, Shinji; Itaya, Kozo; Sato, Kokichi; and Nishida, Hirotaka, 4,392,577, Cl. 215-32.000.

Shirahata, Kunikatsu: *See—*
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Kasai, Masaji; Hirayama, Noriaki; Morimoto, Makoto; and Fukui, Masanori, 4,393,056, Cl. 424-181.000.

Shirai, Takashi: *See—*
Hayashi, Hiroshi; Shimojima, Yukiji; Shirai, Takashi; Ishida, Torao; and Shibukawa, Mitsuru, 4,393,225, Cl. 549-289.000.

Shiraishi, Mitsuru: *See—*
Terao, Shinji; Shiraishi, Mitsuru; and Maki, Yoshitaka, 4,393,075, Cl. 424-304.000.

Shirasaki, Masataka, to Fujitsu Limited. Prism polarizer. 4,392,722, Cl. 350-375.000.

Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, to Canon Kabushiki Kaisha. Method for producing recording head. 4,392,907, Cl. 156-252.000.

Shirayama, Shimpey: *See—*
Nozaki, Shinichi; Tai, Ichiro; and Shirayama, Shimpey, 4,393,307, Cl. 250-390.000.

Shirley, Robert L., to Master Craft Boat Company. Ski boat. 4,392,448, Cl. 114-271.000.

Shiroi, Takashi: *See—*
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,392,923, Cl. 204-59.00R.

Shitamatsu, Ryujiro: *See—*
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,267, Cl. 15-88.000.
Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, 4,392,506, Cl. 134-46.000.

Shmotkin, Mark B.: *See—*
Buryakov, Viktor P.; Ivanov, Gennady M.; Kislik, Mikhail I.; Kurgansky, Pavel M.; Shmotkin, Mark B.; and Eikhenvald, Eduard V., 4,392,551, Cl. 184-7.00D.

Shoup, Leo E. Soft contact lens asepticizing case. 4,392,569, Cl. 206-5.100.

Showa Aluminum Industries K.K.: *See—*
Ohta, Teruto; and Kinoshita, Yoshio, 4,392,926, Cl. 204-67.000.

Showa Chemical Co., Ltd.: *See—*
Hirashima, Tsuneaki; Miyata, Toshiyuki; Yamamoto, Yoshikazu; and Kato, Mitsuyuki, 4,393,216, Cl. 548-305.000.

Showa Manufacturing Co., Ltd.: *See—*
Tsuchiya, Takayoshi; and Matsuo, Masami, 4,392,664, Cl. 280-276.000.

Showman, Robert L.; and Weber, Robert N., to AMP Incorporated. Cam actuated zero insertion force mother/daughter board connector. 4,392,700, Cl. 339-17.00M.

Shows, Everett W., to General Motors Corporation. Gas turbine engine fuel system. 4,392,347, Cl. 60-39.270.

Shroff, Arvind; and Palluel, Pierre, to Thomson-CSF. Hot cathode, its production process and electron tube incorporating such a cathode. 4,393,328, Cl. 313-346.00R.

Shulsinger, Don H.: *See—*
Besen, Peter D.; Shulsinger, Don H.; and Goldberg, Stuart D., 4,393,277, Cl. 179-2.00A.

Shum, Lanson Y., to Westinghouse Electric Corp. Robotic manipulator structure. 4,392,776, Cl. 414-744.00R.

Sid Harvey, Inc.: *See—*
Lindtveit, Herbert E., 4,392,796, Cl. 418-32.000.

Sidchrome (S.E. Asia) Limited: *See—*
Siddall, Michael, 4,392,509, Cl. 137-340.000.

Siddall, Michael, to Sidchrome (S.E. Asia) Limited. Furnace valve. 4,392,509, Cl. 137-340.000.

Siddiqui, Ehtisham U. A.; Wenzel, James L.; and Butterfield, John L., to General Electric Company. Slicer disconnect. 4,392,835, Cl. 464-32.000.

Sidote, George J.: *See—*
Sung, Rodney L.; Sidote, George J.; and Sweeney, William M., 4,392,866, Cl. 44-53.000.

Siebrecht, Gunter: *See—*
Mittelbach, Gunter; Horstmann, Gunter; Heiss, Werner; Hoffmann, Dietrich; Siebrecht, Gunter; Kriechbaum, Karl; and Rapp, Gunter, 4,393,290, Cl. 200-148.00A.

Siegal, Burton L., to Kiwi Coders Corporation. Base-lock type font holder for imprinting apparatus. 4,392,430, Cl. 101-381.000.

Siegmund, Walter P., to Warner Lambert Technologies, Inc. Image intensifier faceplate. 4,393,322, Cl. 313-544.000.

Siemens Aktiengesellschaft: *See—*
Anger, Klaus; Frosien, Juergen; Lischke, Burkhard; Plies, Erich; and Tonar, Klaus, 4,393,308, Cl. 250-396.00R.
Fork, Kurt; Kaufhold, Wolfgang; Meusel, Wolfgang; and Waldmann, Hermann, 4,393,345, Cl. 322-19.000.
Glashauser, Walter; and Ghica, Grigore-Vlad, 4,393,129, Cl. 430-296.000.
Kantz, Dieter; and Seher, Eugen, 4,393,478, Cl. 365-210.000.
Kuenemund, Friedrich L., 4,393,356, Cl. 333-165.000.

Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, 4,392,936, Cl. 204-213.000.
Zeitrag, Rolf, 4,393,496, Cl. 370-62.000.
Sigalos & Levine, P.C.: *See*—
Hall, Alfred E., 4,392,651, Cl. 273-153.00R.
Sigma Research, Inc.: *See*—
Franklin, James L., 4,392,359, Cl. 62-235.100.
Silver, Howard B.: *See*—
Moore, Anthony J.; and Silver, Howard B., 4,392,973, Cl. 252-78.100.
Simko, Richard T.: *See*—
Owen, William H.; Simko, Richard T.; and Tchon, Wallace E., 4,393,481, Cl. 365-228.000.
Simmons, Reginald J.: *See*—
Baker, Robert W.; Owen, Leonard J.; and Simmons, Reginald J., 4,392,706, Cl. 339-91.00R.
Singer Company, The: *See*—
Kreeley, Bruce K., 4,392,512, Cl. 137-496.000.
Sirotnak, Francis M.: *See*—
DeGraw, Joseph I., Jr.; and Sirotnak, Francis M., 4,393,064, Cl. 424-251.000.
Sisis Equipment (Macclesfield) Limited: *See*—
Staniforth, Eric, 4,392,595, Cl. 222-619.000.
Sjardijn, Willem: *See*—
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,393,182, Cl. 526-125.000.
Skarstad, Paul M.; Coury, Arthur J.; and Untereker, Darrel F., to Medtronic, Inc. Battery cathodes. 4,393,125, Cl. 429-105.000.
Skrobisch, Alfred, to Staver Company, Inc., The. Electromagnetic indicator having a rotor disposable in discrete positions. 4,393,362, Cl. 335-272.000.
Skura, William A.; and Cathey, Thaddeus F., to Uniroyal, Inc. Toothed positive drive power transmission belt with a fabric reinforcement suspended within the belt teeth. 4,392,842, Cl. 474-205.000.
Skwirut, Henry; and Young, Robert G., to North American Philips Electric Corp. Method for effectively contacting manganese-activated zinc silicate phosphor with antimony oxide during phosphor coating, and resulting lamp. 4,393,330, Cl. 313-487.000.
Sletzinger, Meyer, to Merck & Co., Inc. Process for preparing methylvanillyl ketone from isoeugenol. 4,393,242, Cl. 568-322.000.
Sloan Kettering Institute for Cancer Research: *See*—
DeGraw, Joseph I., Jr.; and Sirotnak, Francis M., 4,393,064, Cl. 424-251.000.
Smalley, Raymond L., to REB Manufacturing, Inc. Lift safety switch system. 4,392,771, Cl. 414-545.000.
Smart, John D.: *See*—
Berlie, Elmer M.; and Smart, John D., 4,392,816, Cl. 431-202.000.
Berlie, Elmer M.; Smart, John D.; and Zelensky, Michael J., 4,392,817, Cl. 431-202.000.
Smetana, Raymond S.: *See*—
Harbaugh, William L.; and Smetana, Raymond S., 4,393,018, Cl. 264-82.000.
Smit, Geoffrey N., to Borg-Warner Corporation. Metal belt. 4,392,843, Cl. 474-245.000.
Smith, Donald R.: *See*—
Boyd, Mary G.; and Smith, Donald R., 4,392,905, Cl. 156-235.000.
Smith, Edgar M., to RCA Corporation. Method for aging a cathode of a cathode-ray tube, 4,392,834, Cl. 445-6.000.
Smith, Gary F.: *See*—
Baylis, Francis P.; and Smith, Gary E., 4,393,046, Cl. 424-117.000.
Smith, Larry C., to Rexnord Inc. Wear resistant rotor slots for vane-type pumps or motors. 4,392,795, Cl. 418-31.000.
Smith, Norman L., to Ashland Oil, Inc. Energy efficient process for the production of carbon black. 4,393,034, Cl. 423-450.000.
Smith, Paul T.: *See*—
Misciosio, Kathleen B.; and Smith, Paul T., 4,392,921, Cl. 204-47.000.
Smock, Steven W.: *See*—
Kinsey, Brian D.; and Smock, Steven W., 4,392,357, Cl. 62-153.000.
Smolin, William, to Texaco Inc. Separation of para-xylene. 4,393,266, Cl. 585-828.000.
Smorol, Michael E.: *See*—
O'Mara, Raymond D.; Smorol, Michael E.; and Tobin, Curtis L., 4,392,525, Cl. 165-125.000.
Sobotta, Rainer: *See*—
Langbein, Adolf; Merz, Herbert; Sobotta, Rainer; Bauer, Rudolf; Jennewein, Hans M.; and Mierau, Joachim, 4,393,069, Cl. 424-265.000.
Societa Pneumatici Pirelli S.p.A.: *See*—
Bertoldo, Giorgio, 4,392,899, Cl. 156-127.000.
Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See*—
Gauvain, Roger; and Kueny, Michel, 4,392,276, Cl. 19-97.000.
Societe Anonyme des Etablissements Adrien de Backer: *See*—
Yperman, Jacques L., 4,393,440, Cl. 362-309.000.
Societe Anonyme dite L'Oreal: *See*—
Koulbanis, Constantin; Zabotto, Arlette; Griat, Jacqueline; and Charrier, Jean, 4,393,043, Cl. 424-59.000.
Societe Europenne de Propulsion: *See*—
Habermann, Helmut; and Brunet, Maurice, 4,392,693, Cl. 308-10.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Tirole, Jacques P. H.; Mons, Claude M.; and Spinat, Roland R., 4,392,656, Cl. 277-53.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Chareire, Jean-Louis, 4,392,459, Cl. 123-21.000.
Mouille, Rene' L.; Gallot, Jacques R.; and Pouradier, Jean-Marc E., 4,392,781, Cl. 416-223.00R.
Societe SOGEFINA, Societe de Gestion Financiere Armoricaine: *See*—
Herrian, Paul, 4,392,439, Cl. 111-34.000.
Soderberg, John H., to Pitney Bowes Inc. Electronic parcel register. 4,393,454, Cl. 364-518.000.
Sohner, Gerhard: *See*—
Neuhaus, Dieter; Sohner, Gerhard; Ruf, Walter; Jesse, Erich; and Roth, Helmut, 4,393,432, Cl. 361-104.000.
Sony Corporation: *See*—
Kaneko, Shinji, 4,393,413, Cl. 358-326.000.
Kojima, Chiaki; Hasegawa, Kayoko; and Miyahara, Kosuke, 4,393,126, Cl. 430-2.000.
Nagai, Tamiji; and Matsushita, Takeshi, 4,393,337, Cl. 315-408.000.
Tatani, Mitsushige, 4,393,412, Cl. 358-318.000.
Sorieste, Alfonse J., to Ecodyne Corporation. Liquid treatment apparatus. 4,392,955, Cl. 210-195.400.
Souther, Channing: *See*—
Crowley, Kevin J.; and Souther, Channing, 4,392,312, Cl. 36-67.00R.
Spars, Byron G.: *See*—
Wallman, P. Henrik; and Spars, Byron G., 4,392,942, Cl. 208-11.00R.
Spaulding, Bernard B.: *See*—
Knapp, George W.; and Spaulding, Bernard B., 4,393,464, Cl. 364-900.000.
Spencer Wright Industries, Inc.: *See*—
Ingram, Gary L., 4,392,440, Cl. 112-79.00A.
Sperry Corporation: *See*—
Fung, Anthony K., 4,393,458, Cl. 364-900.000.
Stickel, Tedd K.; and Ransom, Stephen A., 4,393,315, Cl. 307-264.000.
Spinat, Roland R.: *See*—
Tirole, Jacques P. H.; Mons, Claude M.; and Spinat, Roland R., 4,392,656, Cl. 277-53.000.
Spinhirne, James M., to United Technologies Corporation. Intracavity phase front and power control. 4,393,303, Cl. 250-201.000.
Spire Corporation: *See*—
Kreisman, Wallace S., 4,393,105, Cl. 428-34.000.
Little, Roger G., 4,392,297, Cl. 29-572.000.
Spradlin, Joseph E.; Morgan, Jeffrey D.; Olson, Allan R.; and Howley, Joseph P., to General Foods Corporation. Enzyme digestion for a dog food of improved palatability. 4,393,085, Cl. 426-28.000.
Spreading Machine Exchange, Inc.: *See*—
Costigan, Conrad A., 4,392,646, Cl. 270-30.000.
Sprecker, Mark A., to International Flavors & Fragrances Inc. Norbornyl ethers. 4,393,247, Cl. 568-665.000.
Sprout, Oliver S., Jr., to Pennwalt Corporation. Preparation of high gamma (α)phase poly(vinylidene fluoride) piezoelectric materials. 4,393,093, Cl. 427-40.000.
Spyder Sales & Service, Inc.: *See*—
Barchard, John, 4,392,541, Cl. 180-209.000.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Process for dechlorinating organic compounds. 4,393,227, Cl. 549-455.000.
SRI International: *See*—
DeGraw, Joseph I., Jr.; and Sirotnak, Francis M., 4,393,064, Cl. 424-251.000.
Stables, Wilbur L.; Pendlebury, David; Saich, Anthony M.; and Hamlyn, Maxwell C., to Allied Corporation. Device having yarn passage of specified dimensions for interlacing filaments of multifilament yarn. 4,392,285, Cl. 28-276.000.
Stacy, Robert A.: *See*—
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; Stacy, Robert A.; and Meyer, Danny D., 4,393,393, Cl. 357-81.000.
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. 1-N(Aminopolyhydroxyalkyl)aminoglycoside antibiotics and method of use. 4,393,051, Cl. 424-180.000.
Staedtler, J. S.: *See*—
Handl, Werner, 4,393,022, Cl. 264-148.000.
Stair, Eugene V. Fuel loader. 4,392,479, Cl. 126-242.000.
Stanadyne, Inc.: *See*—
Lesher, Kenneth W., 4,392,462, Cl. 123-90.550.
Standard Knitting Mills, Inc.: *See*—
Irving, William A.; and Thornton, Robert E., Jr., 4,392,315, Cl. 40-27.000.
Standard Oil Company, The: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,393,192, Cl. 528-292.000.
Li, George S.; Jones, John F.; and Giffen, William M., Jr., 4,393,020, Cl. 264-108.000.
Velenyi, Louis J.; Dolhyj, Serge R.; and Krupa, Andrew S., 4,393,260, Cl. 585-357.000.
Standard Oil Company (Indiana): *See*—
Allen, John K.; and Lammers, Gerard C., 4,393,264, Cl. 585-469.000.
Nimry, Tayseer S.; and Fields, Ellis K., 4,393,222, Cl. 549-234.000.
Paschke, Edward E.; and Petty-Weeks, C. Bruce, 4,393,162, Cl. 524-606.000.
Staniforth, Eric, to Sisis Equipment (Macclesfield) Limited. Apparatus for dispensing particulate material. 4,392,595, Cl. 222-619.000.
Stant Inc.: *See*—
Harris, Robert S., 4,392,507, Cl. 137-38.000.
Stant, Ivan H. Fence wire winder. 4,392,518, Cl. 140-119.000.

Stanton, David J., to Medtronic, Inc. Neuromuscular stimulator. 4,392,496, Cl. 128-423.00W.

Staubitzer, Fred: *See—*
Bohn, Hans; Stein, Wolfgang; Bernsau, Peter; and Staubitzer, Fred, 4,392,909, Cl. 156-306.900.

Stauffer Chemical Company: *See—*
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,392,884, Cl. 71-100.000.

Staver Company, Inc., The: *See—*
Skrobisch, Alfred, 4,393,362, Cl. 335-272.000.

Stavo Industries, Inc.: *See—*
Vogel, George P., 4,392,956, Cl. 210-224.000.

Steele, Raymond, to Bell Telephone Laboratories, Incorporated. Fourier masking analog signal secure communication system. 4,393,276, Cl. 179-1.50R.

Steer, David C.: *See—*
Cox, Roger B.; and Steer, David C., 4,393,089, Cl. 426-573.000.

Steg Siebtechnik GmbH: *See—*
Lefferts, Johannes, 4,392,902, Cl. 156-161.000.

Steifensand Sitzmobel- und Tischfabrik, Inh.: *See—*
Beer, Herbert, 4,392,686, Cl. 297-376.000.

Steigleiter, Werner: *See—*
Engelbach, Heinz; Steigleiter, Werner; and Glietenberg, Helmut, 4,392,984, Cl. 252-432.000.

Stein, Wolfgang: *See—*
Bohn, Hans; Stein, Wolfgang; Bernsau, Peter; and Staubitzer, Fred, 4,392,909, Cl. 156-306.900.

Steinbusch, Hans: *See—*
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Stepanov, Valentin G.: *See—*
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Stephan, Rudolf: *See—*
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Stephens, Thomas W., to American Monitor Corporation. Assay method and reagent for the determination of chloride. 4,393,142, Cl. 436-125.000.

Stepurenko, Ivan R.: *See—*
Golyak, Oleg L.; Golyak, Leonty A.; and Stepurenko, Ivan R., 4,392,805, Cl. 425-206.000.

Sterimatic Holdings Limited: *See—*
Dent, Hugh R., 4,392,859, Cl. 604-198.000.

Sternberger, Ludwig A., to University of Rochester, The. Process for the preparation of biologically active peptide analogues. 4,392,996, Cl. 260-112.00R.

Stetson, Robert L.: *See—*
Lang, Linton W.; and Stetson, Robert L., 4,393,510, Cl. 376-172.000.

Stevens, Aaron A.: *See—*
Buckhouse, Norman O.; Stevens, Aaron A.; and Lawrence, Randall K., 4,392,543, Cl. 180-272.000.

Stevens, Frederick F.: *See—*
Hillberg, Robert L.; and Stevens, Frederick F., 4,392,320, Cl. 42-69.00R.

Stewart, John S.; and Gonek, Stanislaw M., to Brush Switchgear Limited. Gas blast interrupters. 4,393,291, Cl. 200-148.00R.

Stickel, Tedd K.; and Ransom, Stephen A., to Sperry Corporation. High-gain stabilized converter. 4,393,315, Cl. 307-264.000.

Stickler, Johann R. Apparatus for breeding queen honeybees. 4,392,262, Cl. 6-9.000.

Stiefel Laboratories, Inc.: *See—*
Yu, Cheng-Sein, 4,393,061, Cl. 424-248.580.

Stille, John K. Optically active phosphines. 4,393,240, Cl. 568-13.000.

Stinson, Wilbur G.; Schwei, Lawrence J.; and Vong, Sandy T. S., to Ford Motor Company. Process for developing a coating film on a heated glass sheet. 4,393,098, Cl. 427-168.000.

Stoeger, Klaus; Birkle, Siegfried; and Gehring, Johann, to Siemens Aktiengesellschaft. Device for the galvanic deposition of aluminum. 4,392,936, Cl. 204-213.000.

Stolzenburg, Rudolf: *See—*
Schenk, Gunther; Bergthaller, Peter; Wolfrum, Gerhard; and Stolzenburg, Rudolf, 4,393,132, Cl. 430-562.000.

Stone, Roger L.: *See—*
Lucas, Donald S.; Stone, Roger L.; and Cooper, Eugene R., 4,392,848, Cl. 604-53.000.

Strandell, Per-Olof. Two-high rolling stand for bar and/or wire rolling mill. 4,392,370, Cl. 72-201.000.

Straub, Paul J., Jr., to RCA Corporation. Stylus cartridge. 4,393,487, Cl. 369-74.000.

Straub, Robert D.: *See—*
Deckard, John I.; and Straub, Robert D., 4,392,612, Cl. 239-88.000.

Strauch, Karl, to Werner Kammann Maschinenfabrik GmbH. Holding device for a hollow body with an open end and a pivotal handle for printing thereon in a printing machine. 4,392,565, Cl. 198-378.000.

Strauss, Udo: *See—*
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Strewe, Wolfgang: *See—*
Schmitt, Helmut; Strewe, Wolfgang; and Schurig, Helmuth, 4,392,937, Cl. 204-269.000.

Stricker, George O.; Teumer, Karl H.; and Groenendal, Ronald C., to Ludlow Corporation. Hot melt transfer coating process and products. 4,393,117, Cl. 428-352.000.

Stringer, Carl: *See—*
La Force, Jean, 4,392,603, Cl. 228-196.000.

Stringer, Carl Thomas: *See—*
La Force, Jean, 4,392,603, Cl. 228-196.000.

Stringer Oil & Gas Co.: *See—*
La Force, Jean, 4,392,603, Cl. 228-196.000.

Stringham, Roger S.: *See—*
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Stromberg-Carlson Corporation: *See—*
Cray, Edgar R.; Davis, Russell R.; Knapp, Maynard K.; Richards, Glenn L.; Root, Bernard H.; and Woodruff, William W., 4,393,495, Cl. 370-56.000.

Struck, Carl-Heinz; and Schumacher, Ralf, to Dr. C. Otto & Comp. G.m.b.H. System for improving the flow of gases to a combustion chamber of a coke oven or the like. 4,392,824, Cl. 432-180.000.

Studer, John E.: *See—*
Huck, Charles M.; Studer, John E.; and Sauer, Philip H., 4,392,860, Cl. 604-212.000.

Stump, Theodore M.: *See—*
Ashlock, Robert L.; Gabrielson, Carl E.; Kerr, Douglas P.; Rasmussen, David J.; Stump, Theodore M.; and Thode, Charles W., 4,393,491, Cl. 370-13.000.

Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Apparatus for regulating turbochargers and internal combustion engines associated therewith. 4,392,352, Cl. 60-602.000.

Suburban Tool, Inc.: *See—*
Campeau, Gary P., 4,392,643, Cl. 269-136.000.

Suda, Hitoshi: *See—*
Fujii, Takayuki; and Suda, Hitoshi, 4,392,539, Cl. 180-90.000.

Suda, Takayuki; and Yasuda, Koichi, to TDK Electronics Co., Ltd. Coil element. 4,393,364, Cl. 336-65.000.

Sudo, Fumio: *See—*
Kodaka, Mikio; Morishita, Hitoshi; Bada, Hajime; and Sudo, Fumio, 4,392,886, Cl. 75-52.000.

Suefuji, Masahiro: *See—*
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,393,231, Cl. 560-73.000.

Suematsu, Toshio: *See—*
Miyagi, Hideo; Suematsu, Toshio; Nakano, Jiro; and Ono, Hironobu, 4,392,467, Cl. 123-325.000.

Sugamura, Noboru: *See—*
Itakura, Fumitada; and Sugamura, Noboru, 4,393,272, Cl. 179-1.05A.

Sugawara, Noboru, to Kanto Seiki Co., Ltd. Device for connecting speedometer to flexible shaft. 4,392,836, Cl. 464-52.000.

Sugie, Kiyoshi; Yamada, Takeyoshi; and Yamaji, Teizo, to Teitin Limited. Novel silicon-containing copolymer, ultrathin solid membrane composed of said copolymer, use of said solid membrane for concentrating a specified gas in a gaseous mixture, and process for producing said solid membrane. 4,393,113, Cl. 428-220.000.

Sugimura, Mitsuo: *See—*
Tarumi, Niro; Komiya, Shigeo; and Sugimura, Mitsuo, 4,393,184, Cl. 526-261.000.

Sugiura, Kyoji: *See—*
Kimura, Kaoru; and Sugiura, Kyoji, 4,393,183, Cl. 526-245.000.

Sugiura, Masamichi; and Shibazaki, Kenji, to Minolta Camera Co., Ltd. Control system for copying apparatus. 4,393,375, Cl. 340-700.000.

Sugiura, Shigekata; and Kanno, Susumu, to Alps Electric Co., Ltd. Chassis assembly. 4,393,436, Cl. 361-380.000.

Sullins, Richard D.; and Lanter, Kent J., to Ralston Purina Company. Process for the production of a floating aquatic food pellet. 4,393,087, Cl. 426-74.000.

Sullivan, Norman D. Food dispensing gun. 4,392,592, Cl. 222-288.000.

Sumitomo Semento Kabushiki Kaisha: *See—*
Shibuya, Kyoichi; and Ihara, Tomomi, 4,392,353, Cl. 60-657.000.

Sun, Hsiang-ning; Leonard, John J.; and Shalit, Harold, to Atlantic Richfield Company. Hydrogen peroxide production. 4,393,038, Cl. 423-584.000.

Sun Oil Company of Pennsylvania: *See—*
Chieffo, Anibole B.; Davis, Howard K.; and Rizzo, Joyce A., 4,392,870, Cl. 55-20.000.

Suncor, Inc.: *See—*
Roth, Robert B.; and Seitzer, Walter H., 4,392,941, Cl. 208-11.0LE.

Sung, Rodney L.; Sidote, George J.; and Sweeney, William M., to Texaco Inc. Etheramine corrosion inhibitor for alcohols. 4,392,866, Cl. 44-53.000.

Sung, Rodney L.; and Sweeney, William M., to Texaco Inc. Amino corrosion inhibitor for alcohols. 4,392,867, Cl. 44-53.000.

Supertex, Inc.: *See—*
Blanchard, Richard A., 4,393,391, Cl. 357-23.000.

Suzuki, Akira: *See—*
Kaneda, Hiroshi; Arai, Katsuhiko; Suzuki, Akira; and Ohashi, Takashi, 4,393,015, Cl. 264-51.000.

Suzuki, Hirotsugu: *See—*
Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, 4,392,903, Cl. 156-167.000.

Suzuki, Ichiro; Yasumatsu, Jun; Imai, Yoshikazu; and Motonami, Masnao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt system. 4,392,673, Cl. 280-804.000.

Suzuki, Jyuji, to Nippon Elumin Sash Co., Ltd. Pivotable window moved between locked and opened positions by means of a single operating handle. 4,392,329, Cl. 49-356.000.

Suzuki, Kunihiko: *See—*
Kondo, Nobuo; Naganoma, Masanori; Hibi, Hitoshi; Fujii, Tetsuo; and Suzuki, Kunihiko, 4,393,365, Cl. 340-57.000.

Suzuki, Manji. Recorder training device. 4,392,408, Cl. 84-380.00C.
Suzuki, Mitsuo: *See*—
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Koji; and Suzuki, Mitsuo, 4,393,342, Cl. 318-467.000.
Suzuki, Shinichi: *See*—
Torii, Michihiro; Hirukawa, Kohei; Urata, Hiroshi; and Suzuki, Shinichi, 4,393,373, Cl. 340-384.00E.
Suzuki, Yasuhiko: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,393,324, Cl. 313-133.000.
Svendsen, Gordon D., to Ampex Corporation. Serial-to-parallel converter. 4,393,301, Cl. 377-56.000.
Swanson, William J.: *See*—
Volpe, Gerald T.; Laskoski, Leonard S.; Amodeo, Ralph J.; Swanson, William J.; and Gottesman, Jerome D., 4,393,352, Cl. 329-50.000.
Sweeney, William M.: *See*—
Sung, Rodney L.; Sidote, George J.; and Sweeney, William M., 4,392,866, Cl. 44-53.000.
Sung, Rodney L.; and Sweeney, William M., 4,392,867, Cl. 44-53.000.
Swett, James B.; and Arnold, Ann A., to Dart Industries Inc. Watering can. 4,392,594, Cl. 222-530.000.
Swinmurn, Christopher J.: *See*—
Pithouse, Kenneth B.; and Swinmurn, Christopher J., 4,392,898, Cl. 156-85.000.
Swiss Aluminium Ltd.: *See*—
Alder, Hanspeter; and Schalch, Eugen, 4,392,925, Cl. 204-67.000.
Clumpner, Joseph A., 4,392,636, Cl. 266-218.000.
Switall, Thomas G., to Ryco Graphic Manufacturing, Inc. Proportional mixing system with water motor drive. 4,392,508, Cl. 137-99.000.
Switchcraft, Inc.: *See*—
Bailey, James R.; and Lutzenberger, Kurt, 4,392,708, Cl. 339-182.00R.
Sycor, Inc.: *See*—
Vidwans, Mohan P., 4,393,424, Cl. 360-105.000.
Symons, Robert S., to Varian Associates, Inc. Gyrotron transverse energy equalizer. 4,393,332, Cl. 315-4.000.
System Industries Inc.: *See*—
Kyner, Edmond L., 4,393,384, Cl. 346-1.100.
Szabo, Gabor: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.
Szakacs, Gabor L.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,393,448, Cl. 364-449.000.
Szary, Herbert: *See*—
Nix, Hans; and Szary, Herbert, 4,392,305, Cl. 33-169.00F.
Szomor, Maria: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.
Szostak, Daniel J.: *See*—
Goldstein, Bernard; Dresner, Joseph; and Szostak, Daniel J., 4,393,348, Cl. 324-158.00R.
Szvoboda, Ida: *See*—
Palosi, Endre; Heja, Gergely; Korbonits, Dezso; Kiss, Pal; Guczi, Csaba; Cser, Judit; Szvoboda, Ida; Szabo, Gabor; Kallay, Tamas; Ledniczky, Laszlo; and Szomor, Maria, 4,393,008, Cl. 260-465.00D.
T-Bar Incorporated: *See*—
Seiden, Lewis J., 4,393,381, Cl. 340-825.830.
Tada, Ritsuro: *See*—
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.
Taft, John R. Wind powering of turbine having variable pitch vanes. 4,392,780, Cl. 416-17.000.
Tagusari, Koji: *See*—
Nakajima, Isao; Tagusari, Koji; Okuna, Kenji; Hayama, Toru; Takahashi, Kazue; Watanabe, Michihiro; and Kotani, Sumihisa, 4,392,423, Cl. 101-93.480.
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, to Nisshin Flour Milling Co., Ltd. Decaprenylamine derivatives. 4,393,209, Cl. 544-404.000.
Tai, Ichiro: *See*—
Nozaki, Shinichi; Tai, Ichiro; and Shirayama, Shimpey, 4,393,307, Cl. 250-390.000.
Taiho Pharmaceutical Co., Ltd.: *See*—
Senda, Shigeo; Katho, Eiichi; Ohtani, Osamu; Miyake, Hidekazu; and Fujiwara, Khosuke, 4,393,210, Cl. 546-141.000.
Taisei Kako Co., Ltd.: *See*—
Maekawa, Hideyuki; Hiramoto, Shinji; Itaya, Kozo; Sato, Kokichi; and Nishida, Hirotaka, 4,392,577, Cl. 215-32.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Sawada, Jiro; Hanada, Kazunori; Tamai, Masaharu; Morimoto, Shigeo; and Omura, Sadafumi, 4,393,228, Cl. 549-549.000.
Takada, Atsunobu; and Higaki, Yuzo, to Nisshin Oil Mills Limited, The. Steroid ester, and cosmetics and ointments containing the same. 4,393,044, Cl. 424-59.000.
Takada, Juichiro. Emergency locking retractor for a vehicle occupant restraint belt. 4,392,620, Cl. 242-107.40A.
Takagi, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Vacuum circuit breakers. 4,393,286, Cl. 200-144.00B.
Takagi, Shunichi: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,393,324, Cl. 313-133.000.
Takagi, Tohru: *See*—
Sasaki, Takashi; Hagiwara, Miyuki; Hosoi, Fumio; and Takagi, Tohru, 4,393,165, Cl. 525-10.000.
Takagishi, Haruyoshi: *See*—
Fujikawa, Tsuneo; and Takagishi, Haruyoshi, 4,392,601, Cl. 228-4.100.
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, to Hitachi Chemical Company, Ltd. Thermosetting prepolymer from polyfunctional maleimide and bis maleimide. 4,393,188, Cl. 528-88.000.
Takahashi, Kazue: *See*—
Nakajima, Isao; Tagusari, Koji; Okuna, Kenji; Hayama, Toru; Takahashi, Kazue; Watanabe, Michihiro; and Kotani, Sumihisa, 4,392,423, Cl. 101-93.480.
Takahashi, Masami: *See*—
Shibuya, Yoshimichi; and Takahashi, Masami, 4,392,717, Cl. 350-334.000.
Takahashi, Masanori: *See*—
Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, 4,392,903, Cl. 156-167.000.
Takahashi, Masayuki; Goto, Kunihiko; Tanaka, Hisami; and Ohhata, Michinobu, to Fujitsu Limited. Sample and hold circuit. 4,393,318, Cl. 307-353.000.
Takahashi, Michiko: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,392,907, Cl. 156-252.000.
Takahashi, Takao, to Nissan Motor Co., Ltd. Weft picking method and device for carrying out same. 4,392,517, Cl. 139-435.000.
Takahashi, Tomoyuki: *See*—
Sato, Yoshito; and Takahashi, Tomoyuki, 4,392,396, Cl. 74-785.000.
Takahashi, Toshihiro: *See*—
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,393,209, Cl. 544-404.000.
Takano, Genta: *See*—
Shima, Michitsune; Iida, Seiichi; Kihara, Shiso; Minami, Masaharu; Shimoyama, Toshikazu; Takano, Genta; and Kato, Akira, 4,393,294, Cl. 219-121.0EC.
Takano, Takao: *See*—
Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, 4,393,000, Cl. 260-239.00E.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,393,059, Cl. 424-246.000.
Takasugi, Mitsuo; and Okuyama, Ajoshio, to Colpo Company Limited. Injector. 4,392,491, Cl. 604-202.000.
Takatori, Yasushi: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,392,907, Cl. 156-252.000.
Takatsu, Haruyoshi: *See*—
Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, 4,393,258, Cl. 585-25.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Limited. Cephem compounds. 4,393,059, Cl. 424-246.000.
Takayasu, Akira. Clad steel plates. 4,393,122, Cl. 428-594.000.
Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Maki, Yoshitaka, 4,393,075, Cl. 424-304.000.
Takeda, Koichi; and Sasano, Yoshiro, to Daihatsu Motor Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Numerically controlled machine tool. 4,393,449, Cl. 364-474.000.
Takenaka, Shigeo; Kamohara, Eiji; and Seino, Kazuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing mask for color CRT. 4,392,914, Cl. 156-633.000.
Taketoshi, Kazuhisa; and Ogusu, Chihaya, to Nippon Hoso Kyokai. Evaporation device. 4,392,452, Cl. 118-723.000.
Takeuchi, Akihiro; Kobayashi, Masaaki; and Fujisawa, Kiyoji, to Matsushita Electric Industrial Co., Ltd. Tracking system for a videotape recorder. 4,393,416, Cl. 360-10.200.
Takeuchi, Akihiro: *See*—
Kobayashi, Masaaki; Takeuchi, Akihiro; and Fujisawa, Kiyoji, 4,393,417, Cl. 360-10.300.
Takeuchi, Kiyohumi: *See*—
Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, 4,393,258, Cl. 585-25.000.
Takeuchi, Kunthiko; and Belt, James S., to Owens-Corning Fiberglas Corporation. Method of forming glass fibers while monitoring a process condition in a spinner. 4,392,879, Cl. 65-6.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Nakano, Hiroshi, 4,393,047, Cl. 424-118.000.
Talres Development (N.A.) N.V.: *See*—
Cheetham, Peter S. J., 4,393,136, Cl. 435-161.000.
Tamai, Masaharu: *See*—
Sawada, Jiro; Hanada, Kazunori; Tamai, Masaharu; Morimoto, Shigeo; and Omura, Sadafumi, 4,393,228, Cl. 549-549.000.

Tamaoki, Tatsuya: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Kasai, Masaji; Hirayama, Noriaki; Morimoto, Makoto; and Fukui, Masanori, 4,393,056, Cl. 424-181.000.

Tamura, Takashi: *See*—
Inoue, Koji; Sato, Nobukatsu; and Tamura, Takashi, 4,393,219, Cl. 548-534.000.

Tanaka, Asami. Metal-porcelain dental restoration and method of making. 4,392,829, Cl. 433-222.000.

Tanaka, Eiichi; Ishibasi, Noboru; and Inoue, Shojiro, to Matsushita Electric Industrial Co., Ltd. Combustion appliance with safety device. 4,392,813, Cl. 431-76.000.

Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,392,923, Cl. 204-59.00R.

Tanaka, Hisaji: *See*—
Nishiyama, Masanobu; Kanazawa, Fusao; Tanaka, Hisaji; and Nishimura, Tatsuo, 4,392,269, Cl. 15-145.000.

Tanaka, Hisami: *See*—
Takahashi, Masayuki; Goto, Kunihiko; Tanaka, Hisami; and Ohhata, Michinobu, 4,393,318, Cl. 307-353.000.

Tanaka, Masanobu: *See*—
Ikushima, Hiroshi; Baba, Takaaki; Sagishima, Takayuki; and Tanaka, Masanobu, 4,393,400, Cl. 358-92.000.

Tanaka, Masashi: *See*—
Kumada, Akio; Ibochi, Takahiko; Homma, Makoto; and Tanaka, Masashi, 4,392,747, Cl. 368-88.000.

Tanaka, Masato; Furukawa, Shunsuke; Iwamoto, Ikuo; and Doi, Toshitada. Method and apparatus for communicating digital information words by error-correction encoding. 4,393,502, Cl. 371-40.000.

Tanaka, Toshihiko: *See*—
Nakasu, Kei; Ichikawa, Shigeru; Tanaka, Toshihiko; and Ikeda, Mitsuo, 4,392,560, Cl. 188-73.340.

Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for continuously pickling the outer surfaces of tubular materials. 4,392,267, Cl. 15-88.000.

Tanaka, Yoshiro; Moroi, Hayato; Komatsu, Yukihiko; Akagi, Kazuo; Shitamatsu, Ryujiro; and Nishimura, Tadashi, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for conveying tubular materials in pickling facilities of the same. 4,392,506, Cl. 134-46.000.

Tandberg Data A/S: *See*—
Danielsen, Petter; and Moen, Tor, 4,393,378, Cl. 340-744.000.

Tandler, Peter: *See*—
Schopper, Bernd; Lowe, Derek; Reinartz, Hans-Dieter; and Tandler, Peter, 4,392,691, Cl. 303-6.00C.

Tanikawa, Isao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; Hirata, Sadao; Yazaki, Jinichi; and Sakano, Kozaburo, 4,393,106, Cl. 428-35.000.

Tanimoto, Akira; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Electronic translator with means for pronouncing input words and translated words. 4,393,462, Cl. 364-900.000.

Tao, John C., to International Coal Refining Company. Coal-oil slurry preparation. 4,392,940, Cl. 208-8.0LE.

Tarumi, Niro; Komiya, Shigeo; and Sugimura, Mitsuo, to Hoya Lens Corporation. Lens having a high refractive index with a low dispersion. 4,393,184, Cl. 526-261.000.

Tatami, Mitsuhige, to Sony Corporation. Automatic chroma level control circuit for compensating both slow and rapid chroma level changes. 4,393,412, Cl. 358-318.000.

Tatsuhama, Tetsuro; and Okabe, Masao, to Okumura Corporation. Method of and apparatus for determining angular and transversal displacements of shield machine and succeeding pipe. 4,392,744, Cl. 356-153.000.

Tatsumi, Hideo: *See*—
Kanamaru, Hisanobu; Tohkairin, Akira; Tatsumi, Hideo; Asahi, Naotatsu; and Haginoya, Mitsuo, 4,392,296, Cl. 29-520.000.

Taudt, Heinz: *See*—
Gast, Uwe; Hennig, Eberhard; Preuss, Dieter; Taudt, Heinz; and Wellendorf, Klaus, 4,393,399, Cl. 358-80.000.

Taylor, Derek P., to Fastbac Research Limited. Shaped materials. 4,393,116, Cl. 428-343.000.

Tazume, Masayuki: *See*—
Sato, Hisato; Takatsu, Haruyoshi; Fujita, Yutaka; Tazume, Masayuki; Takeuchi, Kiyohumi; and Ohnishi, Hiroyuki, 4,393,258, Cl. 585-25.000.

Tchon, Wallace E.: *See*—
Owen, William H.; Simko, Richard T.; and Tchon, Wallace E., 4,393,481, Cl. 365-228.000.

TDK Electronics Co., Ltd.: *See*—
Fukuda, Kazumasa, 4,393,110, Cl. 428-173.000.
Snda, Takayuki; and Yasuda, Koichi, 4,393,364, Cl. 336-65.000.

Teagarden, Dirk L.: *See*—
DeGeeter, Melvin J.; McCall, John M.; and Teagarden, Dirk L., 4,393,065, Cl. 424-251.000.

Technicare Corporation: *See*—
Gardineer, Bayard G.; and Heringes, James A., 4,392,486, Cl. 128-68.000.

Teckmeyer, Fred W.; and Dorn, George K. Gasoline fuel extender formulation. 4,392,868, Cl. 44-56.000.

Teijin Limited: *See*—
Yakushiji, Satoshi; Yamamoto, Atsushi; Kitamura, Yukio; and Yoshioka, Nobuo, 4,392,286, Cl. 28-289.000.

Teitin Limited: *See*—
Sugie, Kiyoshi; Yamada, Takeyoshi; and Yamaji, Teizo, 4,393,113, Cl. 428-220.000.

Tektronix, Inc.: *See*—
Lewis, John, 4,393,443, Cl. 364-200.000.

Teledyne Industries, Inc.: *See*—
Crocker, William A.; and Hug, Duane L., 4,393,230, Cl. 556-457.000.

Tengi, John P.: *See*—
Keith, Dennis D.; Tengi, John P.; and Weigele, Manfred, 4,393,003, Cl. 260-245.20R.

Teraji, Tsutomu: *See*—
Sato, Yoshinari; and Teraji, Tsutomu, 4,393,070, Cl. 424-266.000.

Terao, Shinji; Shiraishi, Mitsuru; and Maki, Yoshitaka, to Takeda Chemical Industries, Ltd. Quinone compounds and their use in suppressing the production of SRS-A in mammals. 4,393,075, Cl. 424-304.000.

Terwilliger, Gerald L.: *See*—
Merritt, Robert C.; and Terwilliger, Gerald L., 4,392,472, Cl. 123-564.000.

Tessarolo, Francesco: *See*—
Costanzi, Silvestro; Tessarolo, Francesco; and Brunelli, Maurizio, 4,393,218, Cl. 548-530.000.

Teumer, Karl H.: *See*—
Stricker, George O.; Teumer, Karl H.; and Groesendal, Ronald C., 4,393,117, Cl. 428-352.000.

Texaco Inc.: *See*—
Corbeels, Roger J.; and Sengenberger, Charles G., 4,392,981, Cl. 252-373.000.
Estes, John H.; and Herbstman, Sheldon, 4,392,946, Cl. 208-217.000.
Johnson, Fred L., Jr.; and Watts, Lewis W., Jr., 4,393,254, Cl. 568-867.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,392,869, Cl. 48-197.00R.
Schlicht, Raymond C., 4,392,966, Cl. 252-32.70E.
Smolin, William, 4,393,266, Cl. 585-828.000.
Sung, Rodney L.; Sidote, George J.; and Sweeney, William M., 4,392,866, Cl. 44-53.000.
Sung, Rodney L.; and Sweeney, William M., 4,392,867, Cl. 44-53.000.
Yeakey, Ernest L.; and Watts, Lewis W., Jr., 4,393,237, Cl. 564-153.000.

Texas Instruments Incorporated: *See*—
Blades, Brian J., 4,392,608, Cl. 236-48.00R.
Du, Nguyen T.; and Asao, Akihide, 4,392,893, Cl. 148-1.500.
Du, Nguyen T.; and Asao, Akihide, 4,393,479, Cl. 365-218.000.
Grenier, Aime J., 4,393,289, Cl. 200-147.00R.
Kitagawa, Norihisa; and Iwamoto, Eisaburo, 4,393,475, Cl. 365-201.000.
McElroy, David J., 4,393,474, Cl. 365-200.000.

Theyskens, Karel H. A. Tower crane. 4,392,574, Cl. 212-225.000.

Thode, Charles W.: *See*—
Ashlock, Robert L.; Gabrielson, Carl E.; Kerr, Douglas P.; Rasmussen, David J.; Stump, Theodore M.; and Thode, Charles W., 4,393,491, Cl. 370-13.000.

Thoman, James J.: *See*—
Vander Eyken, Gerardus H.; and Thoman, James J., 4,392,446, Cl. 114-144.00R.

Thomas, Alan F.; and Naf, Ferdinand, to Firmenich, SA. Alicyclic unsaturated compounds, their preparation and use of same as perfume ingredients. 4,392,993, Cl. 252-522.00R.

Thomas, Dolphus W., Jr. Clam bucket attachment. 4,392,774, Cl. 414-726.000.

Thomas, Gareth J.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,393,221, Cl. 549-39.000.

Thomas, Paul D. Ceiling suspended product display. 4,392,316, Cl. 40-617.000.

Thomas, William L., to Zenith Radio Corporation. Teletext interface for digital storage medium having synthetic video generator. 4,393,376, Cl. 340-717.000.

Thomas William L.: *See*—
Cox, Charles M.; and Thomas William L., 4,393,404, Cl. 358-147.000.

Thompson, Don D.; Brown, Robert J. S.; and Runge, Richard J., to Chevron Research Company. Method for interpreting well log records to yield indications of gas/oil in an earth formation such as a sandstone, limestone, or dolostone. 4,393,486, Cl. 367-73.000.

Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., to Petrolite Corporation. Compounds containing sulfur and amino groups. 4,393,026, Cl. 422-12.000.

Thompson, Raymond D.: *See*—
Brown, Ross K.; Thompson, Raymond D.; Woods, Terrill W.; Wright, Darrell L.; Conner, James M.; Crookes, William E.; and Purcell, William F., 4,392,546, Cl. 180-326.000.

Thomson, Charles D.: *See*—
Bell, Melvyn R.; and Thomson, Charles D., 4,393,437, Cl. 361-383.000.

Thomson-CSF: *See*—
Beck, Jean L.; le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, 4,393,408, Cl. 358-205.000.
Guedj, Richard; Dieulesaint, Eugene; and Royer, Daniel, 4,393,268, Cl. 178-18.000.
Shroff, Arvind; and Palluel, Pierre, 4,393,328, Cl. 313-346.00R.

Thomson, Michael G. R.: *See*—
Collier, Robert J.; and Thomson, Michael G. R., 4,393,312, Cl. 250-492.200.

Thornton, Robert E., Jr.: *See*—
Irving, William A.; and Thornton, Robert E., Jr., 4,392,315, Cl. 40-27.000.

Tieberg, Lars A.; and Carlqvist, Stig G. Method and plant for recovering heat from smoke gases. 4,392,809, Cl. 431-11.000.

Tif Instruments, Inc.: *See*—
Liebermann, Leonard N., 4,392,374, Cl. 73-19.000.

Timex Corporation: *See*—
LePage, Joseph R., 4,392,284, Cl. 24-265.00B.

Timmons, David R., to Automation Industries, Inc. Grommet clip. 4,392,283, Cl. 24-255.0SL.

Tirole, Jacques P. H.; Moss, Claude M.; and Spinat, Roland R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Air-cooled sealing rings for the wheels of gas turbines. 4,392,656, Cl. 277-53.000.

Titeflex Corporation: *See*—
Adamczyk, Rudolph A., 4,392,678, Cl. 285-256.000.

Toagosei Chemical Industry Co., Ltd.: *See*—
Kimura, Kaoru; and Sugiura, Kyoji, 4,393,183, Cl. 526-245.000.

Tobias, Michael A.; and Lynch, Conrad L., to Mobil Oil Corporation. Polyester coil coating. 4,393,121, Cl. 428-458.000.

Tobin, Curtis L.: *See*—
O'Mara, Raymond D.; Smorol, Michael E.; and Tobin, Curtis L., 4,392,525, Cl. 165-125.000.

Tohkairin, Akira: *See*—
Kanamaru, Hisanobu; Tohkairin, Akira; Tatsumi, Hideo; Asahi, Naotatsu; and Haginoya, Mitsuo, 4,392,296, Cl. 29-520.000.

Tojiki, Hitomi: *See*—
Iwasama, Teruo; and Tojiki, Hitomi, 4,393,340, Cl. 318-301.000.

Tokai Rubber Industries Ltd.: *See*—
Konishi, Keizo, 4,392,639, Cl. 267-140.100.

Tokai TRW & Co., Ltd.: *See*—
Michio, Abe; and Naoyuki, Maeda, 4,392,540, Cl. 180-142.000.

Tokico Ltd.: *See*—
Kato, Tetsuo; and Makita, Naoki, 4,392,638, Cl. 267-64.240.
Oshima, Harumi, 4,392,559, Cl. 188-73.320.
Yamaguchi, Kiyoshi; and Makita, Naoki, 4,392,293, Cl. 29-436.000.

Tokiquchi, Katsumi: *See*—
Sakudo, Noriyuki; Tokiquchi, Katsumi; Koike, Hidemi; Kanomata, Ichiro; and Nakashima, Humihiko, 4,393,333, Cl. 315-111.810.

Tokuhara, Shinji: *See*—
Moriwaki, Takeshi; and Tokuhara, Shinji, 4,393,169, Cl. 525-67.000.

Tokunaga, Takeshi: *See*—
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Koji; and Suzuki, Mitsuo, 4,393,342, Cl. 318-467.000.

Tokuno, Masateru; Ishii, Yoshinori; and Hoshiyama, Hidetoshi, to Rengo Co., Ltd. Web aligning process and apparatus. 4,392,910, Cl. 156-361.000.

Tokura, Seiichi: *See*—
Nishiyama, Masashi; Kobayashi, Yoshinari; Tokura, Seiichi; and Nishi, Norio, 4,392,916, Cl. 162-157.100.

Tokyo Electric Co., Ltd.: *See*—
Fujii, Kunihiko; Hirosaki, Yukihiro; Nishiyama, Yoshihisa; and Sato, Koichiro, 4,392,535, Cl. 177-1.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Nakamine, Chosin, 4,392,736, Cl. 355-3.00R.
Nozaki, Shinichi; Tai, Ichiro; and Shirayama, Shimpey, 4,393,307, Cl. 250-390.000.
Takagi, Kunihiko, 4,393,286, Cl. 200-144.00B.
Takenaka, Shigeo; Kamohara, Eiji; and Seino, Kazuyuki, 4,392,914, Cl. 156-633.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Ozeki, Takeshi, 4,392,712, Cl. 350-96.160.

Tolk, Norman H.: *See*—
Feldman, Leonard C.; Kraus, Joseph S.; Tolk, Norman H.; Traum, Morton M.; and Tully, John C., 4,393,311, Cl. 250-459.100.

Tomaszewski, Thaddeus W., to Occidental Chemical Corporation. Trivalent chromium electrolyte and process employing vanadium reducing agent. 4,392,922, Cl. 204-51.000.

Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., to American Cyanamid Company. 3-[(α-Substituted-benzyl]-2,3,dihydrothiazolo[3,2-a][1,3]diazacyclan-3-ol derivatives. 4,393,004, Cl. 260-245.500.

Tomikawa, Kiyozi: *See*—
Sasai, Mitsuo; Tomikawa, Kiyozi; and Kajiwara, Kazuo, 4,392,295, Cl. 29-509.000.

Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Kasai, Masaji; Hirayama, Noriaki; Morimoto, Makoto; and Fukui, Masanori, to Kyowa Hakko Kogyo Co., Ltd. Antibiotics tetronolide compounds and process for production thereof. 4,393,056, Cl. 424-181.000.

Tomizawa, Yoshio, to Olympus Optical Co., Ltd. Tape run speed-changing circuit. 4,393,420, Cl. 360-73.000.

Tomozawa, Atsushi: *See*—
Maruta, Rikio; and Tomozawa, Atsushi, 4,393,367, Cl. 340-347.0DD.

Tonar, Klaus: *See*—
Anger, Klaus; Frosien, Juergen; Lischke, Burkhard; Plies, Erich; and Tonar, Klaus, 4,393,308, Cl. 250-396.00R.

Tonne, Peter; and Jaedicke, Hagen, to BASF Aktiengesellschaft. Preparation of aromatic sulfohalides. 4,393,211, Cl. 546-153.000.

Toppan Printing Co., Ltd.: *See*—
Fujiu, Takahiro; Nakajima, Masao; and Okano, Shigeru, 4,392,265, Cl. 8-120.000.

Toray Industries: *See*—
Yoshii, Toshiya; Nakura, Satoru; and Murakami, Masatsugi, 4,393,115, Cl. 428-323.000.

Toray Industries, Inc.: *See*—
Endo, Tadakazu; Suzuki, Hirotsugu; and Takahashi, Masanori, 4,392,903, Cl. 156-167.000.

Torii, Michihiro; Hirukawa, Kobei; Urata, Hiroshi; and Suzuki, Shinichi, to Fuji Electrochemical Co., Ltd. Piezoelectric audible sound generator. 4,393,373, Cl. 340-384.00E.

Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing thiazolinozetidinone derivatives. 4,392,923, Cl. 204-59.00R.

Toska Co., Ltd.: *See*—
Hara, Saburo, 4,392,906, Cl. 156-250.000.

Tourdot, Jacques; and Carron, Henry, to L'Air Liquide Societe Anonyme pour l'Etude et l'Exploitation des Procedes. Activating composition for bleaching with peroxide products. 4,392,975, Cl. 252-99.000.

Towmotor Corporation: *See*—
Johansson, Richard J., 4,392,773, Cl. 414-667.000.
Reeves, Jerry L., 4,392,772, Cl. 414-667.000.
Russey, James W., 4,392,554, Cl. 187-9.00E.

Towse, Eric R. Adaptor for facilitating blood sampling procedures. 4,392,499, Cl. 128-764.000.

Toy, Madeline S.; and Stringham, Roger S., to United States of America, Air Force. Copolymers from octafluoronaphthalene. 4,393,198, Cl. 528-397.000.

Toyama, Tadao: *See*—
Shiba, Keisuke; Nakao, Sho; and Toyama, Tadao, 4,393,128, Cl. 430-273.000.

Toyo Kogyo Co., Ltd.: *See*—
Haranaki, Hayathugu; and Tsutagawa, Wataru, 4,392,545, Cl. 180-294.000.

Toyo Seikan Kaisha Limited: *See*—
Kitamura, Yoichi; and Hotta, Hisashi, 4,392,582, Cl. 220-75.000.
Maruhashi, Yoshitsugu; Tanikawa, Isao; Hirata, Sadao; Yazaki, Jinichi; and Sakano, Kozaburo, 4,393,106, Cl. 428-35.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Kubo, Masahige; Yoshimitsu, Mitsuaki; and Katsuragawa, Kaori, 4,393,246, Cl. 568-639.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Inoue, Nobuyoshi; and Kishi, Tomomi, 4,393,293, Cl. 219-90.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kato, Takashi; and Hayakawa, Masaharu, 4,393,012, Cl. 261-39.00A.
Kobashi, Mamoru; and Itoh, Hiroshi, 4,392,468, Cl. 123-339.000.
Miyagi, Hideo; Saematsu, Toshio; Nakano, Jiro; and Ono, Hironobu, 4,392,467, Cl. 123-325.000.
Miyagi, Hideo; and Nakano, Jiro, 4,392,471, Cl. 123-489.000.
Nakasu, Kei; Ichikawa, Shigeru; Tanaka, Toshihiko; and Ikeda, Mitsuo, 4,392,560, Cl. 188-73.340.
Suzuki, Ichiro; Yasumatsu, Jun; Imai, Yoshikazu; and Motonami, Masanao, 4,392,673, Cl. 280-804.000.
Yamamoto, Toshimasa; Mori, Mamoru; and Kinaga, Eiichi, 4,392,672, Cl. 280-803.000.

Tralies, John M.: *See*—
Hammond, David C.; Elchenko, Stephen M.; Tralies, John M.; Verburgt, Peter W.; and Robinson, Leon R., 4,393,483, Cl. 367-13.000.

Traugh, Hubert L. Bicycle rack. 4,392,597, Cl. 224-42.130.

Traum, Morton M.: *See*—
Feldman, Leonard C.; Kraus, Joseph S.; Tolk, Norman H.; Traum, Morton M.; and Tully, John C., 4,393,311, Cl. 250-459.100.

Trio Kabushiki Kaisha: *See*—
Miyamoto, Yukihiko, 4,393,274, Cl. 179-1.0GS.

Trukenbrod, Karl: *See*—
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,393,146, Cl. 521-56.000.

Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand; Marx, Hans-Jurgen; and Scheuermann, Rolf, 4,392,275, Cl. 19-81.000.

Tschantz, William H., to Quadracast, Inc. Bulk material handling and reclaiming equipment. 4,392,566, Cl. 198-509.000.

Tsuchida, Takayasu; and Nakamori, Shigeru, to Ajinomoto Company Incorporated. Method for producing L-glutamic acid by fermentation. 4,393,135, Cl. 435-110.000.

Tsuchiya, Takayoshi; and Matsuo, Masami, to Showa Manufacturing Co., Ltd. Front fork of motorcycle. 4,392,664, Cl. 280-276.000.

Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,393,059, Cl. 424-246.000.

Tsukahara, Taiji: *See*—
Okumura, Taketo; Tsukahara, Taiji; Mikuriya, Takashi; Watanabe, Hideki; and Katada, Katsutoshi, 4,392,371, Cl. 72-231.000.

Tsukamoto Seiki Co., Ltd.: *See*—
Miida, Eishiro, 4,392,534, Cl. 175-340.000.

Tsukanishi, Kenji: *See*—
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.

Tsunefuji, Katsuhiko, to Olympus Optical Company Ltd. Movable reflecting mirror for single lens reflex camera. 4,392,729, Cl. 354-152.000.

Tsurumi Synthetic Refractories Co., Ltd.: *See*—
Yoshinaka, Satoru; Fushida, Masao; and Kimoto, Tatsuzi, 4,393,143, Cl. 501-89.000.

Tsutagawa, Wataru: *See*—
Harasaki, Hayathugu; and Tsutagawa, Wataru, 4,392,545, Cl. 180-294.000.

Tsutsui, Mitsukuni; and Yoshinari, Takashi, to Hitachi, Ltd. Ignition coil for an internal combustion engine. 4,392,473, Cl. 123-635.000.

Tully, John C.: *See*—
Feldman, Leonard C.; Kraus, Joseph S.; Tolk, Norman H.; Traum, Morton M.; and Tully, John C., 4,393,311, Cl. 250-459.100.

Tuovinen, Frans H.: *See*—
Heimala, Seppo O.; Hultholm, Stig E.; and Tuovinen, Frans H., 4,393,029, Cl. 423-55.000.

Turnbough, Harold L.; and Werntz, Charles W., to Alvey Inc. Live roller conveyor. 4,392,568, Cl. 198-781.000.

Turner, Frederick T.: *See*—
Harra, David J.; and Turner, Frederick T., 4,392,938, Cl. 204-298.000.

Tusinski, Joseph; and Hill, Phillip D., to Coburn Optical Industries, Inc. Fluid dispersing apparatus for use in producing ophthalmic lenses. 4,392,334, Cl. 51-263.000.

Tyler, Keith A.; and Fix, Sidney R., to Goodyear Tire & Rubber Company, The. Curable long fiber loaded rubber composition and method of making same. 4,393,154, Cl. 524-12.000.

Tyrell, John A.; and Freimiller, Gary L., to General Electric Company. Carbonate copolymers prepared from imide reactants. 4,393,190, Cl. 528-170.000.

Uberg, Ulf: *See*—
Folkesson, Hans; and Uberg, Ulf, 4,392,368, Cl. 72-63.000.

Uchimura, Hiroshi: *See*—
Ohmori, Hiroyuki; Uchimura, Hiroshi; and Mikage, Yuzo, 4,393,281, Cl. 200-16.00D.

Ueberwolf, Heinz: *See*—
Schwarzenberg, Norbert; Ueberwolf, Heinz; and Kaesmacher, Jakob, 4,392,404, Cl. 83-886.000.

Uehara, Mikio: *See*—
Watanabe, Masazumi; Uehara, Mikio; Shimazu, Yoshimi; Ishiyama, Jiro; and Kato, Motohiko, 4,393,083, Cl. 426-15.000.

Uhde GmbH: *See*—
Schmitt, Helmut; Strewe, Wolfgang; and Schurig, Helmuth, 4,392,937, Cl. 204-269.000.

Uhlig, Albert R.; and Chang, Long F., to Owens-Illinois, Inc. Closure with domed portion. 4,392,579, Cl. 215-253.000.

Uhrhan, Paul; and Krauthausen, Edmund, to Bayer Aktiengesellschaft. Process for the production of 2,3-Dihydro-4H-1,4-benzothiazines. 4,393,206, Cl. 544-51.000.

Ulrich, Lawrence W.; and Walker, Connie W., to Durable Packaging Corporation. Apparatus for sealing cartons. 4,392,911, Cl. 156-468.000.

Umeda, Tatsuo: *See*—
Sasagawa, Masaru; Umeda, Tatsuo; and Kushima, Mamoru, 4,392,400, Cl. 83-185.000.

Umezawa, Hamao; Takeuchi, Tomio; and Nakano, Hiroshi, to Microbiochemical Research Foundation. Antibiotic cytophagin and a process for producing the same. 4,393,047, Cl. 424-118.000.

Union Carbide Corporation: *See*—
Mohr, Paul H.; and Matulewicz, William N., 4,392,972, Cl. 252-75.000.

Union Oil Company of California: *See*—
Delaney, Dennis D.; and Fenton, Donald M., 4,393,037, Cl. 423-573.00R.
Millman, William S., 4,392,985, Cl. 252-435.000.

Uniroyal, Inc.: *See*—
Skura, William A.; and Cathey, Thaddeus F., 4,392,842, Cl. 474-205.000.

United Kingdom Atomic Energy Authority: *See*—
Moody, Brian R.; Lowe, Duncan B.; and Lowe, Derek W., 4,392,435, Cl. 104-284.000.

United States of America
Agriculture: *See*—
Geimer, Robert L., 4,393,019, Cl. 264-83.000.
Air Force: *See*—
Bilow, Norman, 4,393,101, Cl. 427-228.000.
Ennis, Gerald E.; and Colombo, Mario, Jr., 4,392,775, Cl. 414-729.000.
Horner, Joseph L.; and Ludman, Jacques E., 4,392,709, Cl. 350-3.830.
Myer, Robert J., 4,392,624, Cl. 244-158.00A.
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Army: *See*—
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LaFever, Clifford E.; and Peck, John H., 4,392,407, Cl. 89-33.0BB.
Mason, Arthur D., Jr.; Johnson, Avery A., Jr.; Walker, Harrel L.; Bowler, Eleanor G.; and Ritchey, Charles R., 4,393,048, Cl. 424-132.000.
Merkel, George; and Scharf, William D., 4,393,509, Cl. 376-156.000.
Peters, Roswell D. M., 4,392,287, Cl. 29-25.350.
Schmidt, Edward M.; and Kahl, George D., 4,392,412, Cl. 89-14.00D.
Wesson, Jerry J., 4,392,348, Cl. 60-229.000.
Ziegler, George E., 4,393,014, Cl. 264-3.00R.
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Caines, Michael J., 4,392,380, Cl. 73-644.000.
Fultz, Brent T., 4,393,306, Cl. 250-374.000.
Heckman, Richard A., 4,392,995, Cl. 252-627.000.
Lauf, Robert J.; and Morgan, Chester S., 4,393,124, Cl. 429-104.000.
Moore, Stanley W., 4,392,481, Cl. 126-418.000.
Wang, Ching L., 4,393,512, Cl. 378-156.000.
Yang, Chiang Y.; and Rapp, Robert A., 4,392,928, Cl. 204-130.000.
National Aeronautics and Space Administration: *See*—
Brown, Gerald V., 4,392,356, Cl. 62-3.000.
Clemmons, James L. Jr., 4,392,749, Cl. 368-118.000.
McDonald, Glen E., 4,392,920, Cl. 204-37.00R.
Sherman, Allan, 4,393,039, Cl. 423-648.00R.
Yamauchi, Samuel T., 4,392,874, Cl. 55-194.000.
Navy: *See*—
Davies, Kirk E., 4,393,369, Cl. 340-347.0AD.
De Marco, Michael, 4,392,443, Cl. 114-20.00R.
Durrell, Robert R., 4,392,410, Cl. 86-1.00R.
Hammond, David C.; Elchenko, Stephen M.; Tralies, John M.; Verburgt, Peter W.; and Robinson, Leon R., 4,393,483, Cl. 367-13.000.
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,393,350, Cl. 324-334.000.
Reed, Russell, Jr.; Burdette, George W.; Meyers, Gary W.; and Vuono, William R., 4,392,895, Cl. 149-19.300.
U.S. Philips Corporation: *See*—
Boudault, Robert, 4,393,508, Cl. 375-9.000.
Bruggendieck, Siegfried; Nolting, Karl-Heinz; Krahn, Friedrich; and Olejak, Gerhard, 4,392,714, Cl. 350-96.230.
Claasen, Theodoor A. C. M.; Gielis, Gerardus C. M.; Schmidt, Johan M.; and Schoonheijm, Harry B., 4,393,273, Cl. 179-1.0GD.
Crombeen, Jacobus E.; Crooymans, Petrus W. H. M.; and Visser, Jan, 4,392,939, Cl. 204-298.000.
Engelfriet, Adrianus R. C.; Op Het Veld, Adriaan J. G.; and Van Vucht, Theodorus J. P., 4,392,397, Cl. 76-107.00A.
Geis, Hans P.; and Helber, Holger, 4,393,403, Cl. 358-113.000.
Hart, Cornelis M.; and Lohstroh, Jan, 4,393,471, Cl. 365-154.000.
Kunze, Dieter, 4,393,314, Cl. 307-228.000.
Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, 4,393,317, Cl. 307-309.000.
Raven, Johannes G.; and Van Buul, Marinus C. W., 4,393,396, Cl. 358-36.000.
van der Kooi, Auke G., 4,393,325, Cl. 313-552.000.
United Technologies Corporation: *See*—
Angelbeck, Albert W.; and Palma, Gary E., 4,393,503, Cl. 372-20.000.
Madden, William M., 4,392,615, Cl. 239-265.370.
Pearson, David D.; Lemkey, Frank D.; and Kear, Bernard H., 4,392,894, Cl. 148-2.000.
Spinhirne, James M., 4,393,303, Cl. 250-201.000.
Universal Foods Corporation: *See*—
Bittle, Carl E., 4,392,533, Cl. 171-14.000.
University of Iowa Research Foundation: *See*—
Burton, Donald J.; and Flynn, Richard M., 4,393,011, Cl. 260-970.000.
University of Rochester, The: *See*—
Sternberger, Ludwig A., 4,392,996, Cl. 260-112.00R.
Untereker, Darrel F.: *See*—
Skarstad, Paul M.; Coury, Arthur J.; and Untereker, Darrel F., 4,393,125, Cl. 429-105.000.
UOP Inc.: *See*—
Fink, Allen H., 4,392,346, Cl. 60-39.040.
Firth, Bruce E., 4,392,969, Cl. 252-52.00R.
Schmidt, Robert J., 4,393,256, Cl. 568-907.000.
Ward, Dennis J.; and Vora, Bipin V., 4,393,259, Cl. 585-315.000.
Upjohn Company, The: *See*—
Allen, Harry R., 4,393,054, Cl. 424-180.000.
DeGeeter, Melvin J.; McCall, John M.; and Teagarden, Dirk L., 4,393,065, Cl. 424-251.000.
Manis, Jack J.; and Highlander, Sarah K., 4,393,137, Cl. 435-172.000.
Urata, Hiroshi: *See*—
Torii, Michihiro; Hirukawa, Kohei; Urata, Hiroshi; and Suzuki, Shinichi, 4,393,373, Cl. 340-384.00E.
Urayama, Masashi: *See*—
Yokobori, Nobuyoshi; Urayama, Masashi; Okamoto, Hiroshi; and Igarashi, Yoshiaki, 4,393,422, Cl. 360-73.000.
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., to Salk Institute for Biological Studies, The. Analogs of extended N-terminal somatostatin. 4,393,050, Cl. 424-177.000.
Van Abeelen, Petrus C. A. M.; and de Munck, Hans, to General Electric Company. High impact, high modulus reinforced aromatic carbonate polymeric mixtures. 4,393,161, Cl. 524-506.000.
Van Buul, Marinus C. W.: *See*—
Raven, Johannes G.; and Van Buul, Marinus C. W., 4,393,396, Cl. 358-36.000.
Van Capelleveen, Pieter, to Gebr. van Capelleveen B.V. Intermediate storage baking tins. 4,392,768, Cl. 414-278.000.
van den Berg, Johannes C. M. Controlling perceived sound source direction. 4,393,270, Cl. 179-1.00D.
van den Broek, Frederik H. Dismantleable boat cradle. 4,392,627, Cl. 248-176.000.
Vander Eyken, Gerardus H.; and Thoman, James J., to Cinkel Industries, Ltd. Pedestal mount autopilot. 4,392,446, Cl. 114-144.00R.

van der Kooi, Auke G., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp with mercury amalgam. 4,393,325, Cl. 313-552.000.

van der Nat, Adrianus A.: *See*—
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,393,182, Cl. 526-125.000.

Van Heyningen, Roger S., to Eastman Kodak Company. Photographic film cartridge assemblies with removable filters. 4,392,731, Cl. 354-180.000.

Van Landeghem-Heyndericks, Renate, executor: *See*—
Euzen, Jean-Paul; Jacquin, Yves; and Van Landeghem, Hugo, deceased, 4,392,943, Cl. 208-152.000.

Van Landeghem, Hugo, deceased: *See*—
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Van Vucht, Theodorus J. P.: *See*—
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Van Winkle, Denzal W. Valve structure having movable seat means. 4,392,633, Cl. 251-122.000.

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Harra, David J., 4,392,932, Cl. 204-192.00E.
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Veba Oel AG: *See*—
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Velenyi, Louis J.; Dolhyj, Serge R.; and Krupa, Andrew S., to Standard Oil Company, The. Preparation of cyclohexenyl compounds. 4,393,260, Cl. 585-357.000.

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Hammond, David C.; Elchenko, Stephen M.; Tralies, John M.; Verburgt, Peter W.; and Robinson, Leon R., 4,393,483, Cl. 367-13.000.

Verdouw, Albert J., to General Motors Corporation. Combustion liner. 4,392,355, Cl. 60-752.000.

Vereinigte Schmirgel und Maschinen-Fabriken AG: *See*—
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Videki, Edwin R., II: *See*—
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Vidwans, Mohan P., to Sycor, Inc. Pressure arm assembly for disc recorders. 4,393,424, Cl. 360-105.000.

Viellefont, Jean F.; and Dierckxsens, Robert P. L., to Metallurgie Hoboken-Overpelt. Process and apparatus for replacing cathodes. 4,392,934, Cl. 204-198.000.

Viets, Hermann. Directional control of engine exhaust thrust vector in a STOL-type aircraft. 4,392,621, Cl. 244-12.500.

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Vikoma International Limited: *See*—
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Vogel, Ignaz. Seat support slide track structure. 4,392,692, Cl. 308-6.00R.

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Volkmann GmbH & Co.: *See*—
Horstmann, Aloys; Eckholt, Heinz; and Veltel, Reinhard, 4,392,340, Cl. 57-83.000.

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Volpe, Gerald T.; Laskoski, Leonard S.; Amodeo, Ralph J.; Swanson, William J.; and Gottesman, Jerome D., to Perkin-Elmer Corporation, The. Sample-and-hold hybrid active RC filter. 4,393,352, Cl. 329-50.000.

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Voss, Eckart: *See*—
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Wada, Shunichi: *See*—
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Wagener, Anthony P., to Sherwin-Williams Company, The. Corrosion inhibitor for cellulosic insulation. 4,392,994, Cl. 252-602.000.

Wagner, Bill L., Sr., to Bio Clinic Company. Abduction pillow. 4,392,489, Cl. 128-80.00A.

Wagner, Fritz; Lindorfer, Walter; Jahn-Held, Wilhelm; and Schulz, Walther, to Wintershall Aktiengesellschaft; and Gesellschaft fur Biotechnologische Forschung. Process for separating hydrocarbons from particulate solids. 4,392,892, Cl. 134-25.100.

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Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.

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Walker, Harrel L.: *See*—
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Walkup, William B., to Ark-les Corporation. Shorting jumper. 4,392,702, Cl. 339-19.000.

Wallace, John D. Foldable table with foldable support frame. 4,392,437, Cl. 108-112.000.

Wallman, P. Henrik; and Spars, Byron G., to Chevron Research Company. Modified staged turbulent bed process for retorting carbon containing solids. 4,392,942, Cl. 208-11.00R.

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Wampler, Charles W., II: *See*—
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Wang, Ching L., to United States of America, Energy. Hyper-filter-fluorescer spectrometer for x-rays above 120 keV. 4,393,512, Cl. 378-156.000.

Wang Laboratories, Inc.: *See*—
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Ward, Dennis J.; and Vora, Bipin V., to UOP Inc. Process for conversion of propane or butane to gasoline. 4,393,259, Cl. 585-315.000.

Warner-Lambert Company: *See*—
Ciaffone, John T., 4,392,303, Cl. 30-85.000.

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Wasserman, Edel: *See*—
Eisenbaumer, Ronald L.; and Wasserman, Edel, 4,392,978, Cl. 252-182.000.

Watai, Haruhisa; Furuta, Hiroyuki; and Kawamoto, Akira, to Yuken Industry Co., Ltd. Plastic coated with golden evaporated film. 4,393,120, Cl. 428-457.000.

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Watanabe, Hideki: *See*—
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Watanabe, Masazumi; Uehara, Mikio; Shimazu, Yoshimi; Ishiyama, Jiro; and Kato, Motohiko, to Kikkoman Corporation. Method for producing grape must and wine. 4,393,083, Cl. 426-15.000.

Watanabe, Michihiro: *See*—
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Watanabe, Satoshi: *See*—
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Watkins, Hugh: *See*—
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Webb, Michael G., to Vikoma International Limited. Anti-pollution equipment. 4,392,957, Cl. 210-241.000.

Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, to Carl Still Gmbh & Co. KG, Firma. Method and apparatus for indirectly drying and preheating fine material. 4,392,823, Cl. 432-114.000.

Weber, Ralph; Rollinger, Bernt; Nagl, Michael; and Rinner, Bernhard, to Korf-Stahl AG; and Voest-Alpine AG. Metallurgical melting apparatus with a blow-nozzle or burner capable of swivelling in different directions. 4,392,637, Cl. 266-265.000.

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Weeman, John M.: *See*—
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Wege, Regina, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Ink-applying arrangement. 4,392,426, Cl. 101-363.000.

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Weinberg, Leonard, to RCA Corporation. Memory addressing circuit for converting sequential input data to interleaved output data sequence using multiple memories. 4,393,444, Cl. 364-200.000.

Weingartner, Bernhard, to Neutrik Aktiengesellschaft. Electrical connector. 4,392,699, Cl. 339-14.00P.

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Jones, Stanley W.; and Franz, James H., Jr., 4,393,338, Cl. 318-86.000.
Shum, Lanson Y., 4,392,776, Cl. 414-744.00R.
Yannopoulos, Lymperios N.; and Pierre, Joseph F., 4,392,991, Cl. 252-466.00J.

Weston, Paul, to Lucas Industries Limited. Internal combustion engine throttle control. 4,392,502, Cl. 123-342.000.

Westphal, Thomas R. Head support and halo jig. 4,392,645, Cl. 269-328.000.

Westvaco Corporation: *See*—
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Whellams, Geoffrey E. Squirrel cage induction motors. 4,393,344, Cl. 318-759.000.

Whitaker, Graham: *See*—
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White, Joe L.; and Ohlrogge, Alvin J., to Purdue Research Foundation. Ion exchange materials to increase consumption of non-protein nitrogen by ruminants. 4,393,082, Cl. 426-2.000.

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Wieland, Erich G., to Koenig & Bauer AG. Ink fountain for printing machines. 4,392,428, Cl. 101-365.000.

Wieland, Erich G., to Koenig & Bauer AG. Method to maintain smooth running of ink metering elements in ink fountains of printing machines. 4,392,431, Cl. 101-426.000.

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Wier, Franz, to REPA Feinstanzwerk. Lock for safety belts. 4,392,282, Cl. 24-230.0AL.

Wightman, William, Jr. Adjustable face-plate template. 4,392,307, Cl. 33-197.000.

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Wistar Institute of Anatomy and Biology, The: *See*—
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Witiak, Donald T.; and Rahwan, Ralf G., to Ohio State University Research Foundation, The. Compounds and methods for changing calcium metabolism within the cells of a mammal. 4,393,226, Cl. 549-433.000.
Witt, Donald R., to Phillips Petroleum Company. Heating silica gel in inert atmosphere before activation. 4,392,990, Cl. 252-458.000.
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Wolters, Gerhard; and Wagner, Wilhelm, to Daimler-Benz Aktiengesellschaft. Self-igniting internal combustion engine with a rotationally symmetrical piston trough. 4,392,465, Cl. 123-263.000.
Wong, Rayman Y. Pyridylalkyl thiocarbonates as insect repellents. 4,393,068, Cl. 424-263.000.
Wong, Tom C., to General Motors Corporation. Cap and valve assembly. 4,392,583, Cl. 220-202.000.
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Wrightman, Ronald A. Log building construction. 4,392,520, Cl. 144-363.000.
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Freitag, Dieter; Bottenbruch, Ludwig; and Wulff, Claus, 4,393,009, Cl. 260-544.00K.
Wunderwald, Peter: *See*—
Schrenk, Jurgen; and Wunderwald, Peter, 4,393,139, Cl. 435-219.000.
Wunner, William H.: *See*—
Curtis, Peter J.; and Wunner, William H., 4,393,201, Cl. 536-27.000.
Wunning, Joachim. Multiple heat recuperation burner system and method. 4,392,818, Cl. 431-215.000.
Wyoming Mineral Corporation: *See*—
Crossley, Thomas J., 4,393,028, Cl. 423-15.000.
Wyzgol, Ewald; Raschorn, Hans-Jurgen; and Pechau, Gerhard, to VEB Schwermaschinen-Kombinat "ERNST THALMANN" Magdeburg. Drum-type wire shear. 4,392,399, Cl. 83-106.000.
Xicor, Inc.: *See*—
Owen, William H.; Simko, Richard T.; and Tchon, Wallace E., 4,393,481, Cl. 365-228.000.
Yaecker, John, Administrator: *See*—
Gordon, Edmund A., deceased; and Yaecker, John, Administrator, 4,392,344, Cl. 59-78.100.
Yaguchi, Tsuguo: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; Shimane, Koichi; Mogi, Shigeru; Yaguchi, Tsuguo; and Sano, Kazuhiko, 4,393,398, Cl. 358-76.000.
Yahashi, Satoru: *See*—
Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, 4,392,421, Cl. 99-524.000.
Yakushiji, Satoshi; Yamamoto, Atsushi; Kitamura, Yukio; and Yoshioka, Nobuo, to Teijin Limited. Apparatus for taking up a bundle of filaments. 4,392,286, Cl. 28-289.000.
Yamada, Kunihiro, to Ricoh Company, Ltd. Shift register. 4,393,482, Cl. 365-236.000.
Yamada, Takashi: *See*—
Fujinami, Hiroshi; and Yamada, Takashi, 4,393,271, Cl. 179-1.05M.
Yamada, Takeyoshi: *See*—
Sugie, Kiyoshi; Yamada, Takeyoshi; and Yamaji, Teizo, 4,393,113, Cl. 428-220.000.
Yamagata, Tetsuya: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Tetsuya; and Ide, Hiroyuki, 4,393,076, Cl. 424-317.000.
Yamago, Naoyoshi: *See*—
Ida, Michiaki; Hagiwara, Noriaki; Yamago, Naoyoshi; Yoshioka, Masahiro; and Kikuchi, Katsuaki, 4,392,751, Cl. 384-99.000.
Yamaguchi, Akihiro: *See*—
Mita, Ryuichi; Higuchi, Chojiro; Kato, Toshio; Kawashima, Nobuyuki; Yamaguchi, Akihiro; Nagai, Shosuke; and Takano, Takao, 4,393,000, Cl. 260-239.00E.
Yamaguchi, Keiki, to Yokogawa Electric Works. Ultrasonic diagnostic equipment. 4,392,379, Cl. 73-626.000.
Yamaguchi, Kiyoshi; and Makita, Naoki, to Tokico Ltd. Method of assembling combination shock absorber and air spring. 4,392,293, Cl. 29-436.000.
Yamaguchi, Kiyoshi: *See*—
Maki, Naoki; Numata, Seiji; Yamaguchi, Kiyoshi; and Yamamoto, Heroe, 4,393,429, Cl. 361-19.000.
Yamaji, Teizo: *See*—
Sugie, Kiyoshi; Yamada, Takeyoshi; and Yamaji, Teizo, 4,393,113, Cl. 428-220.000.
Yamamoto, Atsushi: *See*—
Yakushiji, Satoshi; Yamamoto, Atsushi; Kitamura, Yukio; and Yoshioka, Nobuo, 4,392,286, Cl. 28-289.000.
Yamamoto, Heroe: *See*—
Maki, Naoki; Numata, Seiji; Yamaguchi, Kiyoshi; and Yamamoto, Heroe, 4,393,429, Cl. 361-19.000.
Yamamoto, Takashi: *See*—
Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, 4,392,421, Cl. 99-524.000.
Yamamoto, Toshimasa; Mori, Mamoru; and Kinaga, Eiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Webbing retractor. 4,392,672, Cl. 280-803.000.
Yamamoto, Yoshikazu: *See*—
Hirashima, Tsuneaki; Miyata, Toshiyuki; Yamamoto, Yoshikazu; and Kato, Mitsuyuki, 4,393,216, Cl. 548-305.000.
Yamasaki, Saburo: *See*—
Hiraiwa, Kazuyoshi; and Yamasaki, Saburo, 4,393,285, Cl. 200-61.880.
Yamashita, Koji, to Nippon Electric Co., Ltd. Mobile antenna mounting assembly. 4,393,383, Cl. 343-903.000.
Yamauchi, Koji: *See*—
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Koji; and Suzuki, Mitsuo, 4,393,342, Cl. 318-467.000.
Yamauchi, Samuel T., to United States of America, National Aeronautics and Space Administration. Degassifying and mixing apparatus for liquids. 4,392,874, Cl. 55-194.000.
Yanagiuchi, Shigenobu: *See*—
Tanimoto, Akira; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,393,462, Cl. 364-900.000.
Yang, Chiang Y.; and Rapp, Robert A., to United States of America, Energy. Method of doping a semiconductor. 4,392,928, Cl. 204-130.000.
Yang, Tai-Cheng; Rao, Krishna K.; and Huang, I-Der, to Exxon Research & Engineering Co. Catalyst for carboxylic anhydride production. 4,392,986, Cl. 252-435.000.
Yanma Agricultural Equipment Company Limited: *See*—
Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, 4,392,421, Cl. 99-524.000.
Yannopoulos, Lymperios N.; and Pierre, Joseph F., to Westinghouse Electric Corp. Method of making α-hematite catalyst. 4,392,991, Cl. 252-466.00J.
Yano, Akira; Saito, Yoshitada; and Kasahara, Yasuhi, to Fujizoki Pharmaceutical Co., Ltd. Standard blood filter paper for use in diagnosis of histidinemia. 4,393,134, Cl. 435-29.000.

Yano, Noriyuki; Yahashi, Satoru; Shimazaki, Kanzo; Nakazawa, Mitsuaki; and Yamamoto, Takashi, to Seirei Industry Company Limited; and Yanma Agricultural Equipment Company Limited. Rice hulling and sorting device. 4,392,421, Cl. 99-524.000.
Yasuda, Koichi: *See*—
Seda, Takayuki; and Yasuda, Koichi, 4,393,364, Cl. 336-65.000.
Yasuhara, Seishi, to Nissan Motor Co., Ltd. Diesel engine having a dual lubrication system. 4,392,463, Cl. 123-196.00M.
Yasumatsu, Jun: *See*—
Suzuki, Ichiro; Yasumatsu, Jun; Imai, Yoshikazu; and Motonami, Masanao, 4,392,673, Cl. 280-804.000.
Yasunobe, Junji: *See*—
Shimizu, Masami; and Yasunobe, Junji, 4,392,752, Cl. 384-135.000.
Yates, Winston F.: *See*—
Milligan, Charles A.; Videki, Edwin R., II; and Yates, Winston F., 4,393,445, Cl. 364-200.000.
Yazaki, Jinichi: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; Hirata, Sadao; Yazaki, Jinichi; and Sakano, Kozaburo, 4,393,106, Cl. 428-35.000.
Yazawa, Satoru: *See*—
Hosokawa, Minoru; Ikeda, Masayuki; and Yazawa, Satoru, 4,393,380, Cl. 340-805.000.
Yeakey, Ernest L.; and Watts, Lewis W., Jr., to Texaco Inc. Polyoxyalkylenepolyacrylamides. 4,393,237, Cl. 564-153.000.
Yip, Kin F.: *See*—
Helfrich, Elaine A.; and Yip, Kin F., 4,392,864, Cl. 8-506.000.
Yokobori, Nobuyoshi; Urayama, Masashi; Okamoto, Hiroshi; and Igarashi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Device for driving magnetic tape. 4,393,422, Cl. 360-73.000.
Yokogawa Electric Works: *See*—
Yamaguchi, Keiki, 4,392,379, Cl. 73-626.000.
Yokogawa, Tomoshisa; and Gomi, Shintaro, to Pioneer Electric Corporation. Input signal level control device for receiver. 4,393,513, Cl. 455-243.000.
Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Contour correcting apparatus for video signals. 4,393,407, Cl. 358-166.000.
Yokozawa, Shunya: *See*—
Takahashi, Akio; Wajima, Motoyo; Tada, Ritsuro; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,393,188, Cl. 528-88.000.
Yonekura, Seiji: *See*—
Matsuoka, Shigeru; Tokunaga, Takeshi; Yonekura, Seiji; Yamauchi, Koji; and Suzuki, Mitsuo, 4,393,342, Cl. 318-467.000.
Yoshida Industry Co., Ltd.: *See*—
Watanabe, Nobuhisa, 4,392,503, Cl. 132-83.00R.
Yoshida Kogyo K. K.: *See*—
Iai, Kenichiro, 4,392,291, Cl. 29-408.000.
Matsuda, Yoshio, 4,392,363, Cl. 66-193.000.
Yoshida, Muneaki. Camera with focal-plane shutter having contrast control. 4,392,728, Cl. 354-49.000.
Yoshida, Takao: *See*—
Calderone, Nicholas; Watkins, Hugh; and Yoshida, Takao, 4,392,976, Cl. 252-174.110.
Yoshida, Takashi: *See*—
Makabe, Osamu; Murai, Yasushi; Okonogi, Tuneo; Onodera, Masahiro; Koyama, Yoshiyuki; and Yoshida, Takashi, 4,393,058, Cl. 424-246.000.
Yoshida, Tsuyoshi: *See*—
Miki, Nobuaki; Kawamoto, Mutsumi; Shibata, Kazuhiko; Yoshida, Tsuyoshi; and Amano, Hiroyuki, 4,393,467, Cl. 364-424.100.
Yoshii, Hisao, to Dainichi Kogyo Co., Ltd. Control circuit for gasified liquid fuel combustion apparatus. 4,392,812, Cl. 431-73.000.
Yoshii, Toshiya; Nakura, Satoru; and Murakami, Masatsugi, to Toray Industries. Multilayered polypropylene film. 4,393,115, Cl. 428-323.000.
Yoshimitsu, Mitsuaki: *See*—
Kubo, Masashige; Yoshimitsu, Mitsuaki; and Katsuragawa, Kanzi, 4,393,246, Cl. 568-639.000.
Yoshimoto, Koichi, to Hanshin Sogyo Co., Ltd. Two-wheeled roller skate. 4,392,659, Cl. 280-11.230.
Yoshinaka, Satoru; Fushida, Masao; and Kimoto, Tatsuzi, to Tsurumi Synthetic Refractories Co., Ltd. Amorphous refractory settable at low temperatures. 4,393,143, Cl. 501-89.000.
Yoshinari, Takashi: *See*—
Tsutsui, Mitsukuni; and Yoshinari, Takashi, 4,392,473, Cl. 123-635.000.
Yoshino, Masahito, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal watch. 4,392,748, Cl. 368-88.000.
Yoshioka, Masahiro: *See*—
Ida, Michiaki; Hagiwara, Noriaki; Yamago, Naoyoshi; Yoshioka, Masahiro; and Kikuchi, Katsuaki, 4,392,751, Cl. 384-99.000.
Yoshioka, Nobuo: *See*—
Yakushiji, Satoshi; Yamamoto, Atsushi; Kitamura, Yukio; and Yoshioka, Nobuo, 4,392,286, Cl. 28-289.000.
Yoshitsugu, Seikichi; and Shimatsu, Misoru, to Nissan Motor Company Limited. Vehicle body structure. 4,392,684, Cl. 296-185.000.
You, Chin-San. Method of producing a racket frame. 4,393,024, Cl. 264-162.000.
Young, Robert G.: *See*—
Skwirut, Henry; and Young, Robert G., 4,393,330, Cl. 313-487.000.
Yperman, Jacques L., to Societe Anonyme des Etablissements Adrien de Backer. Cover assembly for airport guidance light. 4,393,440, Cl. 362-309.000.
Yquel, Jean-Pierre, to L'Oreal. Measuring instrument with automatic loading and an automatic cycle, for studying the tensile characteristics of fibres. 4,392,384, Cl. 73-830.000.
Yu, Cheng-Sein, to Stiefel Laboratories, Inc. Anesthetic-antipruritic morpholine compounds, compositions and use. 4,393,061, Cl. 424-248.580.
Yuken Industry Co., Ltd.: *See*—
Watai, Haruhisa; Furuta, Hiroyuki; and Kawamoto, Akira, 4,393,120, Cl. 428-457.000.
Yuniskis, Donald G., Jr.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,393,448, Cl. 364-449.000.
Yuyama, Yasuaki: *See*—
Honjo, Satoru; Yuyama, Yasuaki; Iwasa, Masakazu; and Imanishi, Kazuo, 4,393,112, Cl. 428-207.000.
Zabotto, Arlette: *See*—
Koulbanis, Constantin; Zabotto, Arlette; Griat, Jacqueline; and Charrier, Jean, 4,393,043, Cl. 424-59.000.
Zajac, John, to Eaton Corporation. Wafer support system. 4,392,915, Cl. 156-643.000.
Zehender, Ernst: *See*—
Grunwald, Werner; Zehender, Ernst; Friese, Karl-Hermann; Schmatz, Jurgen; Neu, Hans; Kirner, Kuno; and Schumacher, Bernd, 4,393,282, Cl. 200-19.00R.
Zeidler, Ulrich: *See*—
Fischer, Herbert; Budnowski, Manfred; and Zeidler, Ulrich, 4,393,060, Cl. 424-248.500.
Zeiger, Terry L.: *See*—
Woodward, Kenneth E.; and Zeiger, Terry L., 4,392,464, Cl. 123-196.00R.
Zeiler, Hans-Joachim: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; and Zeiler, Hans-Joachim, 4,393,051, Cl. 424-180.000.
Zeitraeg, Rolf, to Siemens Aktiengesellschaft. Method for feeding call progress tones into conference connections. 4,393,496, Cl. 370-62.000.
Zelensky, Michael J.: *See*—
Berlie, Elmer M.; Smart, John D.; and Zelensky, Michael J., 4,392,817, Cl. 431-202.000.
Zellerman, Gabor: *See*—
Oreopoulos, Dimitrios G.; and Zellerman, Gabor, 4,392,855, Cl. 604-175.000.
Zemp, Hans N., to Etablissement Texcontor. Anionic ion exchange resins with cholesterol-decreasing properties. 4,393,145, Cl. 521-38.000.
Zengel, Hans-Georg; and Bergfeld, Manfred, to Akzo NV. Method for the production of blocked isocyanates. 4,393,238, Cl. 564-255.000.
Zenith Radio Corporation: *See*—
Cox, Charles M.; and Thomas William L., 4,393,404, Cl. 358-147.000.
De Vries, Adrian J., 4,393,358, Cl. 333-194.000.
Lehnert, Stanley E., 4,393,329, Cl. 313-477.00R.
Thomas, William L., 4,393,376, Cl. 340-717.000.
Ziegler, George E., to United States of America, Army. Method of casting explosive charge with high solids content. 4,393,014, Cl. 264-3.00R.
Zimmerman, Ted R.: *See*—
Wright, Forrest S.; and Zimmerman, Ted R., 4,392,745, Cl. 356-348.000.
Zimmermann, Frank: *See*—
Hofbauer, Peter; Scholz, Romanus; Heidemeyer, Paulus; and Zimmermann, Frank, 4,392,394, Cl. 74-689.000.
Zirker, Guenter: *See*—
Broecker, Franz J.; Hupfer, Leopold; Merger, Franz; Miesen, Ernest; Paetsch, Juergen; and Zirker, Guenter, 4,393,251, Cl. 568-811.000.
Zorbalas, George S., to RCA Corporation. Rapid stepping of a moving recorded medium. 4,393,421, Cl. 360-73.000.
501 Ferranti Limited: *See*—
Pitches, Brian E.; Murray, Robert M. S.; and Rogers, Douglas J., 4,392,378, Cl. 73-304.00C.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JULY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ampex Corporation: *See*—
Miller, Jerry W., Re. 31,311, Cl. 360-40.000.

Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., to Du Pont de Nemours, E. I., and Company. High solids ambient temperature curing coatings of acrylic-fatty acid drying oil resins. Re. 31,309, Cl. 523-459.000.

Armco Inc.: *See*—
Elias, James A., deceased; Newby, John R.; and Pierson, Marvin B., Re. 31,306, Cl. 148-12.00F.

Dow Chemical Company, The: *See*—
Najvar, Daniel J., Re. 31,310, Cl. 525-531.000.

Du Pont de Nemours, E. I., and Company: *See*—
Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., Re. 31,309, Cl. 523-459.000.

Elias, James A., deceased (by Elias, June G., executrix); Newby, John R.; and Pierson, Marvin B., to Armco Inc. Cold rolled, ductile, high strength steel strip and sheet and method therefor. Re. 31,306, Cl. 148-12.00F.

Elias, June G., executrix: *See*—
Elias, James A., deceased; Newby, John R.; and Pierson, Marvin B., Re. 31,306, Cl. 148-12.00F.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tsukiji, Yoshihiro, Re. 31,304, Cl. 29-27.00C.

Kelly, Renee J.: *See*—
Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., Re. 31,309, Cl. 523-459.000.

MacKenzie, Kenneth A.; and Verhoeff, Abraham, to Shell Internationale Research Maatschap, IIJ B.V. Method for preparing clay-based grease compositions. Re. 31,307, Cl. 252-28.000.

McLaughlin, Joseph E.: *See*—
Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., Re. 31,309, Cl. 523-459.000.

Miller, Jerry W., to Ampex Corporation. DC Free encoding for data transmission system. Re. 31,311, Cl. 360-40.000.

Moran, Harold J., to Switlik Parachute Company, Inc. Life preserver of the encapsulated type. Re. 31,305, Cl. 441-123.000.

Najvar, Daniel J., to Dow Chemical Company, The. Impact resistant vinyl ester resin and process for making same. Re. 31,310, Cl. 525-531.000.

Newby, John R.: *See*—
Elias, James A., deceased; Newby, John R.; and Pierson, Marvin B., Re. 31,306, Cl. 148-12.00F.

Pierson, Marvin B.: *See*—
Elias, James A., deceased; Newby, John R.; and Pierson, Marvin B., Re. 31,306, Cl. 148-12.00F.

Shell Internationale Research Maatschap, IIJ B.V.: *See*—
MacKenzie, Kenneth A.; and Verhoeff, Abraham, Re. 31,307, Cl. 252-28.000.

Switlik Parachute Company, Inc.: *See*—
Moran, Harold J., Re. 31,305, Cl. 441-123.000.

Tsukiji, Yoshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Machine for drilling holes in right-angular work surfaces. Re. 31,304, Cl. 29-27.00C.

Verhoeff, Abraham: *See*—
MacKenzie, Kenneth A.; and Verhoeff, Abraham, Re. 31,307, Cl. 252-28.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Hanson, Alden W., Method of generating snow. B1 2,968,164, Cl. 62—74.

Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., to Minnesota Mining and Manufacturing Company. Wire-splicing apparatus and method. B1 3,708,779, Cl. 339—99 R.

Minnesota Mining and Manufacturing Company: *See*—
Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., B1 3,708,779, Cl. 339—99 R.

Palenchar, Daniel P.; Lehker, Wayne H.; and Lock, David P., to Kardex Systems, Inc. Universal motor control. B1 3,866,100, Cl. 318—257.

Kardex Systems, Inc.: *See*—
Palenchar, Daniel P.; Lehker, Wayne H.; and Lock, David P.

LIST OF DESIGN PATENTEES

A.P.C. Industries, Inc.: *See*—
Marks, Barry M., 269,664, Cl. D10-104.000.

Allibert S.A.: *See*—
Deconinck, Didier, 269,653, Cl. D6-56.000.

Allison Corporation: *See*—
Seltzer, Samuel M.; and Dennison, Saul, 269,672, Cl. D13-10.000.

Allison, Philip J., to T. S. Simms & Co. Limited. Paint roller frame. 269,650, 7-12-83, Cl. D4-38.100.

American Safety Razor Company: *See*—
Chase, David O.; and Maloney, Martin, 269,724, Cl. D28-46.000.

American Standard Inc.: *See*—
Niemann, James E., 269,696, Cl. D23-28.000.

Amway Corporation: *See*—
Powers, Robert M., 269,660, Cl. D7-409.000.

Baker Instruments Corp.: *See*—
Parker, Bernard, 269,703, Cl. D24-8.000.

Barbour, Bruce E. Electric sheet music page turner. 269,683, 7-12-83, Cl. D17-99.000.

Baxter Travenol Laboratories, Inc.: *See*—
Green, Brian C., 269,706, Cl. D24-63.000.

Bendix Corporation, The: *See*—
Fulmer, Keith H.; and Kytta, Oswald O., 269,670, Cl. D13-1.000.
Horsting, John J., 269,671, Cl. D13-1.000.

Blowers, Dorothy L., to Pacific Furniture Manufacturing Co. Seat. 269,651, 7-12-83, Cl. D6-47.000.

Bor, Marta. Infant wrapping blanket. 269,658, 7-12-83, Cl. D6-267.000.

Bragin, David G.: *See*—
Swett, James B.; and Bragin, David G., 269,656, Cl. D6-130.000.

Burgin, James R.: *See—*
Cooke, Brian G.; and Burgin, James R., 269,725, Cl. D34-06.000.

Cameron, Jerry L. Formal men's suit. 269,645, 7-12-83, Cl. D2-29.000.

Chambers, Charles: *See—*
Harris, Jeff; Horwitz, Jack; and Chambers, Charles, 269,690, Cl. D21-190.000.

Chase, David O.; and Maloney, Martin, to American Safety Razor Company. Twin blade razor. 269,724, 7-12-83, Cl. D28-46.000.

Cincinnati Milacron Inc.: *See—*
Morser, Alfred H.; and Watson, Robert C., 269,681, Cl. D15-199.000.

Claman, Mike T., to Lewittes Furniture Enterprises, Inc. Chair. 269,654, 7-12-83, Cl. D6-57.000.

Claman, Mike T. Chair. 269,655, 7-12-83, Cl. D6-57.000.

Clemar Manufacturing Corp.: *See—*
Graham, Cleve A.; Tisserat, Craig R.; and Mendoza, Enric C., 269,697, Cl. D23-38.000.

Coats & Clark, Inc.: *See—*
Einhorn, Ruediger, 269,661, Cl. D8-367.000.

Coca-Cola Company, The: *See—*
May, Timothy J.; and Wendt, David W., 269,699, Cl. D23-150.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 269,687, Cl. D21-59.000.

Cooke, Brian G.; and Burgin, James R., to Overseas Corporation. Litter bin. 269,725, 7-12-83, Cl. D34-06.000.

Cooper, Benjamin F.; and Major, Paul D., to Micromation, Inc. Computer. 269,678, 7-12-83, Cl. D14-102.000.

Crawford, Donald A. Stove. 269,698, 7-12-83, Cl. D23-97.000.

Dart Industries Inc.: *See—*
Swett, James B.; and Bragin, David G., 269,656, Cl. D6-130.000.

Deconinck, Didier, to Allibert S.A. Arm chair. 269,653, 7-12-83, Cl. D6-56.000.

Dennison, Saul: *See—*
Seltzer, Samuel M.; and Dennison, Saul, 269,672, Cl. D13-10.000.

De Pascalis, Donato. Cake. 269,644, 7-12-83, Cl. D1-15.000.

Dispositivos Reductores de Tabaco, S.A. (Sodire): *See—*
Torreblanca Cervantes, Rafael, 269,710, Cl. D27-51.000.

Dobias, John J. Mortar. 269,693, 7-12-83, Cl. D22-3.000.

Downey, David P.: *See—*
McKean, Eric J.; and Downey, David P., 269,652, Cl. D6-48.000.

Drackett Company, The: *See—*
Jones, David A.; Koshido, Yasuhiro; and Maust, Daniel A., 269,649, Cl. D4-03.000.
O'Neil, William J., Jr., 269,695, Cl. D23-150.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Hook. 269,661, 7-12-83, Cl. D8-367.000.

Ekholm, Pertti: *See—*
Suovaniemi, Osmo; Ekholm, Pertti; Kaukanen, Esko; and Kukka, Aarre, 269,702, Cl. D24-8.000.

Espedalen, Kare. Tire chain for slip prevention of vehicle. 269,666, 7-12-83, Cl. D12-154.000.

Foggia, Donald A.; Muzumdar, Deepak R.; Klaiber, Gerhart F.; and Schneider, Rolf E., to Siemens Corporation. Telephone busy lamp field console. 269,675, 7-12-83, Cl. D14-58.000.

Fulmer, Keith H.; and Kytta, Oswald O., to Bendix Corporation, The. Backing plate for servomotor diaphragm. 269,670, 7-12-83, Cl. D13-1.000.

Graham, Cleve A.; Tisserat, Craig R.; and Mendoza, Enric C., to Clemar Manufacturing Corp. Sprinkler system control housing. 269,697, 7-12-83, Cl. D23-38.000.

Gravity Guidance, Inc.: *See—*
Miller, Jack V., 269,701, Cl. D24-03.000.

Green, Brian C., to Baxter Travenol Laboratories, Inc. Dispensing container for pharmaceutical diluents. 269,706, 7-12-83, Cl. D24-63.000.

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Lehr, Harold. Mobile. 269,665, 7-12-83, Cl. D11-141.000.

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Luntz, Richard. Writing instrument or similar article. 269,684, 7-12-83, Cl. D19-47.000.

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Molenaar, Lester V. Spinning toy. 269,688, 7-12-83, Cl. D21-95.000.

Morooka, Shinichi, to Sharp Corporation. Electronic computer. 269,679, 7-12-83, Cl. D14-106.000.

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Ohanian, Charles. Bracket for coin change holder. 269,728, 7-12-83, Cl. D99-34.000.
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O'Neil, William J., Jr., to Drackett Company, The. Room deodorizer dispenser. 269,695, 7-12-83, Cl. D23-150.000.
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Thual, Jacques G. L., to Hunter Douglas International N.V. Decorative slat assembly for a suspended ceiling or the like. 269,707, 7-12-83, Cl. D25-88.000.
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Pan-American Plant Company: *See*—
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120 4,392,450
690 4,392,451
723 4,392,452
726 4,392,453

CLASS 119

2 4,392,454

CLASS 122

20 A 4,392,455

CLASS 123

1 A 4,392,456
1 R 4,392,457
18 R 4,392,458
21 4,392,459
80 BB 4,392,460
90.16 4,392,461
90.55 4,392,462
196 M 4,392,463
196 R 4,392,464
263 4,392,465
299 4,392,466
325 4,392,467
339 4,392,468
342 4,392,502
387 4,392,469
440 4,392,470
489 4,392,471
564 4,392,472
635 4,392,473
644 4,392,474

CLASS 124

35 A 4,392,475

CLASS 125

30 R 4,392,476

CLASS 126

77 4,392,477
84 4,392,478
242 4,392,479
400 4,392,480
418 4,392,481
440 4,392,482
450 4,392,483
4,392,484

CLASS 128

6 4,392,485
68 4,392,486
79 4,392,562
80 A 4,392,489
80 H 4,392,487
80 R 4,392,488
202.27 4,392,490
316 4,392,493
326 4,392,494
334 R 4,392,495
423 W 4,392,496
637 4,392,497
665 4,392,498
764 4,392,499

CLASS 130

26 4,392,500

CLASS 131

300 4,392,501

CLASS 132

83 R 4,392,503

CLASS 133

1 A 4,392,504
4 A 4,392,505

CLASS 134

10 4,392,891
25.1 4,392,892
46 4,392,506

CLASS 136

260 4,393,267

CLASS 137

38 4,392,507
99 4,392,508
340 4,392,509
454.2 4,392,510
493.2 4,392,511
496 4,392,512
614.01 4,392,513
624.2 4,392,514

CLASS 139

55.1 4,392,515
115 4,392,516
435 4,392,517

CLASS 140

119 4,392,518

CLASS 144

212 4,392,519
363 4,392,520

CLASS 148

1.5 4,392,893
2 4,392,894
12 F Re.31,306

CLASS 149

19.3 4,392,895

CLASS 152

218 4,392,521
341 4,392,522

CLASS 156

39 4,392,896
66 4,392,897
85 4,392,898
127 4,392,899
153 4,392,900
155 4,392,901
161 4,392,902
167 4,392,903
194 4,392,904
235 4,392,905
250 4,392,906
252 4,392,907
306.9 4,392,909
361 4,392,910
468 4,392,911
504 4,392,912
584 4,392,913
633 4,392,914
643 4,392,915

CLASS 162

157.1 4,392,916
168.1 4,392,917

CLASS 164

453 4,392,523

CLASS 165

76 4,392,524
125 4,392,525
154 4,392,526

CLASS 166

55.2 4,392,527
153 4,392,528
255 4,392,529
269 4,392,530
278 4,392,531
372 4,392,532

CLASS 171

14 4,392,533

CLASS 175

340 4,392,534

CLASS 177

1 4,392,535
134 4,392,537

CLASS 178

18 4,393,268
22.08 4,393,269

CLASS 179

1 D 4,393,270
1 GD 4,393,273
1 GS 4,393,274
1 SA 4,393,272
1 SM 4,393,271
1 VL 4,393,275
1.5 R 4,393,276
2 A 4,393,277
84 C 4,393,278
175.31 R 4,393,279

CLASS 180

19 R 4,392,538
90 4,392,539
142 4,392,540
209 4,392,541
217 4,392,536
228 4,392,542
272 4,392,543
273 4,392,544
294 4,392,545
326 4,392,546

CLASS 181

135 4,392,547
156 4,392,548
239 4,392,549

CLASS 182

82 4,392,550

CLASS 184

7 D 4,392,551
106 4,392,552

CLASS 186

61 4,392,553

CLASS 187

9 E 4,392,554

CLASS 188

65.1 4,392,555

67 4,392,556
71.9 4,392,557
72.7 4,392,558
73.32 4,392,559
73.34 4,392,560
73.36 4,392,561

CLASS 193

10 4,392,563

CLASS 194

1 N 4,392,564

CLASS 198

378 4,392,565
509 4,392,566
544 4,392,567
781 4,392,568

CLASS 200

4 4,393,280
16 D 4,393,281
19 R 4,393,282
51.09 4,393,283
60 4,393,284
61.88 4,393,285
144 B 4,393,286
144 R 4,393,287
4,393,288
147 R 4,393,289
148 A 4,393,290
148 R 4,393,291

CLASS 202

228 4,392,919

CLASS 204

37 R 4,392,920
47 4,392,921
51 4,392,922
59 R 4,392,923
64 T 4,392,924
67 4,392,925
4,392,926
98 4,392,927
130 4,392,928
158 HA 4,392,929
159.14 4,392,930
192 E 4,392,932
192 R 4,392,931
198 4,392,934
206 4,392,935
213 4,392,936
269 4,392,937
298 4,392,938
4,392,939
403 4,392,933

CLASS 206

5.1 4,392,569
231 4,392,570
557 4,392,571

CLASS 208

8 LE 4,392,940
11 LE 4,392,941
11 R 4,392,942
152 4,392,943
188 4,392,944
210 4,392,945
217 4,392,946
229 4,392,947
254 R 4,392,948

CLASS 209

5 4,392,949
211 4,392,950
307 4,392,951

CLASS 210

159 4,392,952
169 4,392,953
195.3 4,392,954
195.4 4,392,955
224 4,392,956
241 4,392,957
493.2 4,392,958
638 4,392,959
651 4,392,960
679 4,392,961
688 4,392,962
692 4,392,963

CLASS 211

19 4,392,572

CLASS 212

225 4,392,574
230 4,392,573

CLASS 213

76 4,392,575

CLASS 215

1 C 4,392,576
32 4,392,577
231 4,392,578
253 4,392,579
332 4,392,580
348 4,392,581

CLASS 219

69 M 4,393,292
90 4,393,293
121 EC 4,393,294
121 EJ 4,393,295
121 PC 4,393,296
137 R 4,393,297
137.62 4,393,298
446 4,393,299
497 4,393,300

CLASS 220

75 4,392,582
202 4,392,583
374 4,392,584

CLASS 221

1 4,392,585
210 4,392,586

CLASS 222

63 4,392,587
129.4 4,392,588
137 4,392,589
174 4,392,590
227 4,392,591
288 4,392,592
305 4,392,593
530 4,392,594
619 4,392,595

CLASS 223

43 4,392,596

CLASS 224

42.13 4,392,597
155 4,392,598

CLASS 227

40 4,392,599
50 4,392,600

CLASS 228

4.1 4,392,601
118 4,392,602
196 4,392,603
212 4,392,604

CLASS 229

19 4,392,605
23 R 4,392,606
39 R 4,392,607

CLASS 235

474 4,393,302

CLASS 236

48 R 4,392,608

CLASS 237

5 S 4,392,610
12.3 C 4,392,609

CLASS 239

74 4,392,611
88 4,392,612
115 4,392,613
215 4,392,614
265.37 4,392,615
271 4,392,616
290 4,392,617
461 4,392,618

CLASS 242

107.2 4,392,619
107.4 A 4,392,620

CLASS 244

12.5 4,392,621
102 A 4,392,622
102 R 4,392,623
158 A 4,392,624

CLASS 246

34 CT 4,392,625
34 R 4,392,626

CLASS 248

176 4,392,627
202.1 4,392,628
205 R 4,392,629
309 R 4,392,630

CLASS 250

201 4,393,303
343 4,393,304
358.1 4,393,305
374 4,393,306
390 4,393,307
396 R 4,393,308
4,393,309
398 4,393,310
459.1 4,393,311
492.2 4,393,312
560 4,393,313

CLASS 251

58 4,392,631
65 4,392,632
122 4,392,633
129 4,392,634

CLASS 252

8.5 C 4,392,964
8.8 4,392,965
28 Re.31,307
32.7 E 4,392,966
41 4,392,967
51.5 R 4,392,968
52 R 4,392,969
62.9 4,392,970
70 4,392,971
75 4,392,972
78.1 4,392,973
99 4,392,974
4,392,975
174.11 4,392,976
174.19 4,392,977
182 4,392,978
184 4,392,979
4,392,980
373 4,392,981
408.1 4,392,982
429 B 4,392,983
432 4,392,984
435 4,392,985
4,392,986
448 4,392,987
455 R 4,392,988
455 Z 4,392,989
458 4,392,990
466 J 4,392,991
512 4,392,992
522 R 4,392,993
602 4,392,994
627 4,392,995

CLASS 254

344 4,392,635

CLASS 260

112 R 4,392,996
112.5 R 4,392,997
146 R 4,392,998
157 4,392,999
239 E 4,393,000
239.1 4,393,001
239.3 R 4,393,002
245.2 R 4,393,003
245.5 4,393,004
245.73 4,393,005
349 4,393,006
378 4,393,007
465 D 4,393,008
544 K 4,393,009
940 4,393,010
970 4,393,011

CLASS 261

39 A 4,393,012
64 B 4,393,013

CLASS 264

3 R 4,393,014
51 4,393,015
53 4,393,016
4,393,017
82 4,393,018
83 4,393,019
108 4,393,020
143 4,393,021
148 4,393,022
150 4,393,023
162 4,393,024

CLASS 266

218 4,392,636
265 4,392,637

CLASS 267

64.24 4,392,638
140.1 4,392,639
141.2 4,392,640

CLASS 269

49 4,392,641
73 4,392,642
136 4,392,643
157 4,392,644
328 4,392,645

CLASS 270

30 4,392,646

CLASS 272

3 4,392,647
24 4,392,648
67 4,392,649

CLASS 273

29 A 4,392,650
153 R 4,392,651
358 4,392,652
400 4,392,653
423 4,392,654

CLASS 277

1 4,392,655
53 4,392,656
95 4,392,657

CLASS 280

11.18 4,392,658
11.23 4,392,659
12 M 4,392,661
43.23 4,392,662
68 4,392,663
276 4,392,664
414.2 4,392,665
614 4,392,666
690 4,392,667
721 4,392,668
751 4,392,660
775 4,392,669
4,392,670
802 4,392,671
803 4,392,672
804 4,392,673
825 4,392,674

CLASS 282

23 R 4,392,675

CLASS 285

61 4,392,676
137 R 4,392,677
256 4,392,678

CLASS 294

15 4,392,679
78 R 4,392,680

CLASS 295

7 4,392,681

CLASS 296

26 4,392,682
37.9 4,392,683
185 4,392,684

CLASS 297

119 4,392,685
376 4,392,686

CLASS 298

5 4,392,687
22 R 4,392,688

CLASS 299

39 4,392,689

CLASS 301

121 4,392,690

CLASS 303

6 C 4,392,691

CLASS 307

228 4,393,314
264 4,393,315
270 4,393,316
309 4,393,317
353 4,393,318

CLASS 308

6 R 4,392,692
10 4,392,693
184 R 4,392,694
187.2 4,392,695

CLASS 310

80 4,393,319
156 4,393,320
313 B 4,393,321

CLASS 312

330 R 4,392,696
348 4,392,697

CLASS 313

110 4,393,323
133 4,393,324
346 R 4,393,328
477 R 4,393,329
487 4,393,330
489 4,393,331
544 4,393,322
552 4,393,325
582 4,393,326

CLASS 315

4 4,393,332
111.81 4,393,333
167 4,393,334
241 P 4,393,335
241 R 4,393,327
387 4,393,336
408 4,393,337

CLASS 318

257 B1 3,866,100
86 4,393,338
254 4,393,339
301 4,393,340
443 4,393,341
467 4,393,342
640 4,393,343
759 4,393,344

CLASS 322

19 4,393,345

CLASS 323

280 4,393,346
355 4,393,157

CLASS 324

126 4,393,347
158 R 4,393,348
248 4,393,349
334 4,393,350

CLASS 328

127 4,393,351

CLASS 329

50 4,393,352

CLASS 330

102 4,393,353
280 4,393,354
294 4,393,355

CLASS 333

165 4,393,356
4,393,357
194 4,393,358

CLASS 335

128 4,393,359
164 4,393,360
212 4,393,361
272 4,393,362
288 4,393,363

CLASS 336

65 4,393,364

CLASS 339

99 B1 3,708,779
10 4,392,698
14 P 4,392,699
17 M 4,392,700
17 R 4,392,701
19 4,392,702
49 R 4,392,703
75 MP 4,392,704
4,392,705
91 R 4,392,706
125 R 4,392,707
182 R 4,392,708

CLASS 340

57 4,393,365
347 AD 4,393,368
4,393,369
4,393,371
4,393,372
347 DA 4,393,370
347 DD 4,393,367
384 E 4,393,373
405 4,393,374
700 4,393,375
717 4,393,376
731 4,393,377
744 4,393,378
784 4,393,379
805 4,393,380
825.83 4,393,381

CLASS 343

112 D 4,393,382
903 4,393,383

CLASS 346

1.1 4,393,384
75 4,393,385
4,393,386
108 4,393,387
140 R 4,393,388
153.1 4,393,389
155 4,393,390

CLASS 350

3.83 4,392,709
96.16 4,392,712
96.21 4,392,713
96.23 4,392,714
96.33 4,392,715
4,392,716
163 4,392,724
334 4,392,717
336 4,392,718
342 4,392,719
357 4,392,720
4,392,721
361 4,392,711
375 4,392,722
407 4,392,723
505 4,392,710

CLASS 351

224 4,392,725

CLASS 354

25 4,392,726
43 4,392,727
49 4,392,728
152 4,392,729
173 4,392,730
180 4,392,731
187 4,392,732
266 4,392,733

CLASS 355

3 DD 4,392,735
3 FU 4,392,739
3 R 4,392,734
4,392,736
4,392,737
3 TR 4,392,738
14 R 4,392,741
14 SH 4,392,740
15 4,392,742
75 4,392,743

CLASS 356

153 4,392,744
348 4,392,745
409 4,392,746

CLASS 357

23 4,393,391
74 4,393,392
81 4,393,393

CLASS 358

22 4,393,394
23 4,393,395
36 4,393,396
4,393,397
76 4,393,398
80 4,393,399
92 4,393,400
107 4,393,401
111 4,393,402
113 4,393,403
147 4,393,404
153 4,393,405
160 4,393,406
166 4,393,407
205 4,393,408
227 4,393,409
285 4,393,410
302 4,393,411
318 4,393,412
326 4,393,413
336 4,393,414

CLASS 360

9.1 4,393,415
10.2 4,393,416
10.3 4,393,417
22 4,393,418
37.1 4,393,419
40 Re.31,311
73 4,393,420
4,393,421
4,393,422
93 4,393,423
105 4,393,424
4,393,425
4,393,426
112 4,393,427
123 4,393,428

CLASS 361

19 4,393,429
92 4,393,430
97 4,393,431
104 4,393,432
119 4,393,433
286 4,393,434
377 4,393,435
380 4,393,436
383 4,393,437
401 4,393,438

CLASS 362

182 4,393,439
309 4,393,440

CLASS 363

61 4,393,441
70 4,393,442

CLASS 364

200 4,393,443
4,393,444
4,393,445
4,393,446
4,393,470
415 4,393,466
424.1 4,393,467
426 4,393,447
449 4,393,448
474 4,393,449

4,393,450
510 4,393,451
514 4,393,452
4,393,453
518 4,393,454
519 4,393,455
724 4,393,456
726 4,393,457
736 4,393,468
900 4,393,458
4,393,459
4,393,460
4,393,461
4,393,462
4,393,463
4,393,464
4,393,465
4,393,469

CLASS 365

154 4,393,471
190 4,393,472
4,393,473
200 4,393,474
201 4,393,475
203 4,393,476
210 4,393,478
218 4,393,479
222 4,393,477
227 4,393,480
228 4,393,481
236 4,393,482

CLASS 367

13 4,393,483
23 4,393,484
25 4,393,485
73 4,393,486
75 4,393,488

CLASS 368

88 4,392,747
4,392,748
118 4,392,749
228 4,392,750

CLASS 369

74 4,393,487
86 4,393,489

CLASS 370

13 4,393,490
4,393,491
15 4,393,492
16 4,393,493
27 4,393,494
56 4,393,495
62 4,393,496
89 4,393,497

CLASS 371

5 4,393,499
13 4,393,500
20 4,393,498
33 4,393,501
40 4,393,502

CLASS 372

20 4,393,503
45 4,393,504
57 4,393,505
59 4,393,506

CLASS 373

81 4,393,507

CLASS 375

9 4,393,508

CLASS 376

133 4,392,918
156 4,393,509
172 4,393,510
247 4,393,025

CLASS 377

56 4,393,301

CLASS 378

128 4,393,511
156 4,393,512

CLASS 382

2 4,393,366

CLASS 384

99 4,392,751
135 4,392,752
136 4,392,753

CLASS 400

119 4,392,754
4,392,755
144.2 4,392,756
328 4,392,757
697.1 4,392,758

CLASS 403

11 4,392,759

CLASS 406

88 4,392,760

CLASS 408

59 4,392,761

CLASS 410

116 4,392,762

CLASS 411

342 4,392,763

CLASS 413

69 4,392,764

CLASS 414

30 4,392,765
113 4,392,766
136 4,392,767
278 4,392,768
397 4,392,769
432 4,392,770
545 4,392,771
667 4,392,772
4,392,773
726 4,392,774
729 4,392,775
744 R 4,392,776

CLASS 415

131 4,392,777
139 4,392,778
141 4,392,779

CLASS 416

17 4,392,780
223 R 4,392,781

CLASS 417

36 4,392,782
50 4,392,786
68 4,392,783
103 4,392,784
218 4,392,785
269 4,392,787
4,392,788
312 4,392,789
360 4,392,790
379 4,392,791
400 4,392,792
462 4,392,793
475 4,392,794

CLASS 418

31 4,392,795
32 4,392,796
91 4,392,797
102 4,392,798
169 4,392,799

CLASS 422

12 4,393,026
269 4,393,027

CLASS 423

15 4,393,028
55 4,393,029
167 4,393,030
239 4,393,031
320 4,393,032
388 4,393,033
450 4,393,034
478 4,393,035
4,393,036
573 R 4,393,037
584 4,393,038
648 R 4,393,039

CLASS 424

1 4,393,040
19 4,393,041
49 4,393,042
59 4,393,043
4,393,044
95 4,393,045
117 4,393,046
118 4,393,047
132 4,393,048
145 4,393,049
177 4,393,050
180 4,393,051
4,393,052
4,393,053
4,393,054
4,393,055
181 4,393,056
229 4,393,057
246 4,393,058
4,393,059
248.5 4,393,060
248.58 4,393,061
250 4,393,062
251 4,393,063
4,393,064
4,393,065
4,393,066
256 4,393,067
263 4,393,068
265 4,393,069
266 4,393,070
274 4,393,071
4,393,081
275 4,393,072
284 4,393,073
285 4,393,074
304 4,393,075
317 4,393,076
326 4,393,077
330 4,393,078
331 4,393,079

CLASS 425

71 4,392,801
78 4,392,800
107 4,392,802
126 S 4,392,803
174.8 E 4,392,804
206 4,392,805
286 4,392,806
393 4,392,807
464 4,392,808

CLASS 426

2 4,393,082
15 4,393,083
19 4,393,084
28 4,393,085
74 4,393,086
4,393,087
234 4,393,088
573 4,393,089
646 4,393,090

CLASS 427

13 4,393,091
38 4,393,092
40 4,393,093
44 4,393,094
87 4,393,095
90 4,393,096
94 4,393,097
168 4,393,098
177 4,393,099
181 4,393,100
194 4,392,908
228 4,393,101
243 4,393,102
391 4,393,103

CLASS 428

7 4,393,104
34 4,393,105
35 4,393,106
42 4,393,107
44 4,393,108
119 4,393,109
173 4,393,110
195 4,393,111
207 4,393,112
220 4,393,113
252 4,393,114
323 4,393,115
343 4,393,116
352 4,393,117
355 4,393,080
403 4,393,118
413 4,393,119
457 4,393,120
458 4,393,121
594 4,393,122

CLASS 429

24 4,393,123
104 4,393,124
105 4,393,125

CLASS 430

2 4,393,126
5 4,393,127
273 4,393,128
296 4,393,129
313 4,393,130
320 4,393,131
562 4,393,132

CLASS 431

11 4,392,809
37 4,392,810
4,392,811
73 4,392,812
76 4,392,813
170 4,392,814
175 4,392,815
202 4,392,816
4,392,817
215 4,392,818
231 4,392,819
284 4,392,820

CLASS 432

96 4,392,821
106 4,392,822
114 4,392,823
180 4,392,824

CLASS 433

5 4,392,825
7 4,392,826
32 4,392,827
217 4,392,828
222 4,392,829

CLASS 434

258 4,392,830
291 4,392,831

CLASS 435

6 4,393,133
29 4,393,134
110 4,393,135
161 4,393,136
172 4,393,137
176 4,393,138
219 4,393,139
226 4,393,140

CLASS 436

63 4,393,141
125 4,393,142

CLASS 440

49 4,392,832

CLASS 441

69 4,392,833
123 Re.31,305

CLASS 445

6 4,392,834

CLASS 455

243 4,393,513
336 4,393,514
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D1—	15	269,644	D7—	11	269,659		10	269,672		59	269,687	D24—	8	269,702			269,715
D2—	29	269,645		311	269,680		24	269,673		95	269,688			269,703			269,716
D3—	71	269,646		409	269,660	D14—	53	269,674		128	269,689		03	269,701			269,717
	72	269,647	D8—	367	269,661		58	269,675		190	269,690		33	269,704			269,718
	73	269,648	D10—	57	269,662		80	269,676		191	269,691			269,705			269,719
D4—	03	269,649		69	269,663			269,677		200	269,692		63	269,706			269,720
	38.1	269,650		104	269,664		102	269,678	D22—	3	269,693	D25—	88	269,707			269,721
D6—	47	269,651	D11—	141	269,665		106	269,679		25	269,694			269,708			269,722
	48	269,652	D12—	154	269,666	D15—	199	269,681	D23—	28	269,696		89	269,709			269,723
	56	269,653		157	269,667	D16—	131	269,682		38	269,697	D27—	51	269,710		46	269,724
	57	269,654		303	269,668	D17—	99	269,683		97	269,698	D28—	2	269,711	D34—	06	269,725
		269,655		332	269,669	D19—	47	269,684		150	269,695			269,712		24	269,726
	130	269,656	D13—	1	269,670	D20—	15	269,685			269,699			269,713	D92—	1.1	269,727
	199	269,657			269,671	D21—	13	269,686		151	269,700			269,714	D99—	34	269,728
	267	269,658															

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